THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
January 9, 1989 · Vol. XXIII · No. 1 · 94 Pages · $2/Copy · $44/Year

COMPUTERWORLD

INSIDE

Executive Report — Forget the ivy walls: Computers make the campus. Page 43.

In Depth — Index of 1988 features. Page 51.

Profile: Fleet/Norstar merger called on every professional skill Michael Zucchini possesses as he consolidated systems and data centers. Page 55.

Prime watch continues, with MAI claiming more than 50% of stock headed its way and hinting at willingness to up the price. Page 85.

Largest IBM AS/400 sale for private network inked in Britain, with buyer to run Citicorp group's banking system. Page 10.

AT&T holds Unix at arm's length in separate division aimed at soothing third-party vendors. Page 17.

Take cover? Norad communications system upgrade plan beset by software problems and wiring incompatibility. Page 4.

GM embraces fiber optics for MAP — in theory but not in practice. Page 6.

Alliant woes continue as minisuper vendor trims work force 20% in bid to stem losses. Page 85.

Honeywell Bull axes 1,600 jobs

BY NELL MARGOLIS
CW STAFF

BILLERICA, Mass. — Honeywell Bull, Inc. announced Friday it will streamline its U.S. work force by some 1,600 — 16% of the current complement.

The move is an attempt to attain fighting trim for "leaner, harder, faster competition" in a turbulent computer industry, said Roland Pampei, Honeywell Bull president.

While he declined to specify a figure, Pampel said that the reduction is expected to save the $2 billion international Bull partnership "a lot of money: It will result in a fairly significant improvement in overall costs."

The move may prove more effective than many other instances of work force reduction, including some at Honeywell Bull, predicted Donald Bellomy, an analyst at International Data Corp., a market research firm in Framingham, Mass. "They're not just protecting the bottom line, although there is that aspect; they're also focusing on redundancies and inefficiences that really do exist," Bellomy said.

The partnership of Groupe Bull, Honeywell, Inc. and NEC Corp. necessarily left Honeywell

Continued on page 85

DEC bids for desk top — again

Rollout to blanket workstation power range, hint at SAA alternative

BY JAMES DALY
CW STAFF

MAYNARD, Mass. — In terms of reaching the desktop market, it's crunch time for DEC.

Digital Equipment Corp. will begin at least its third attempt to win the hearts and dollars of desktop users tomorrow when it unleashes an array of hardware and software products designed to quickly and cleanly make it a dominant player in the flourishing desktop market.

The major hardware components of what DEC officials called the largest introduction in the firm's 31-year history — the extravaganza will fill a building in nearby Littleton, Mass., that has been dubbed Dectop University for the occasion — will range from personal computers to workstations capable of processing about 10 million instructions per second. In one fell swoop, DEC hopes to blunt the expansion of competitors like Sun Microsystems, Inc. that have carved out significant market share.

Additionally, DEC faces the slippery marketing task of selling to users who still remember its unsuccessful 1982 desktop rollout, at which the company introduced three incompatible systems: Decmate, Rainbow and Professional. The 1985 Vaxmate introduction was also nothing short of a sales disaster.

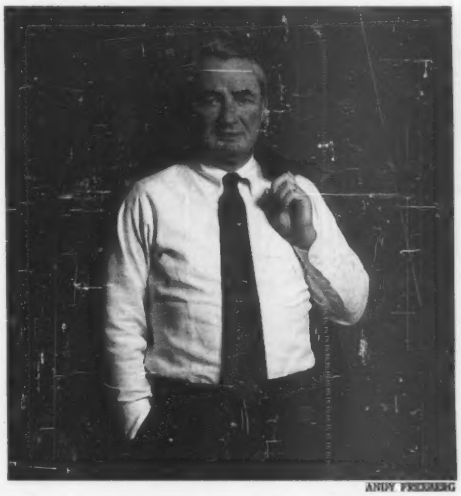
The machine that analysts claimed will be most likely to put sweat on DEC's competitors'

Continued on page 8

Inside

• Decwindows is cornerstone of SAA antidote. Page 8.
• HP set to try and blunt DEC edge. Page 7.

John Akers speaks out



ANDY FREEBERG

IBM is 'more humble' *after weathering tough times but is ready to help MIS deal with challenges, Akers says in exclusive interview.* *Pages 14, 15.*

No managers need apply at this site

BY ALAN J. RYAN
CW STAFF

ST. LOUIS — When the first self-managed work group within McDonnell Douglas Corp.'s information systems organization was formed, it took the group 15 minutes just to decide when its first meeting should be held. "Tuesday is bad for me." "I have a dentist appointment Wednesday morning." It went on and on because there was no manager who could simply say, "Meeting at 10 a.m. Tuesday. Be there."

It isn't easy to get started in self-managed work groups, in which employees are their own bosses. But the vision of Wendell O. Jones, McDonnell Douglas' director of information resource management, is that self-managed groups will eventually encompass all of the functional areas of his 220-member corporate IS organization and change the way it is managed.

TREND SETTERS

The concept is not new to the company, although this is the first time it has been tried in IS. According to Jones, McDonnell Douglas was using the approach in its manufacturing operations. In fact, Jones said he sees the manufacturing experience as justification for such a change: "There is a high level of employee commitment. . . . People feel empowered to be responsible for the quality of the process and product rather than having bosses or supervisors tell them what to do."

But the self-management concept was not mandated for IS, and Jones said he was initially unaware of his company's experience in that area until he began considering it himself. "I found out that what I am doing is being encouraged throughout my organization," he said.

Jones' objective is to expand the concept's use as rapidly as possible, although there are situations — such as one-person projects and geographically separated teams — in which it will not be feasible. But although he conceded that some managers may not be ready for such a change, he added that "most of my programmer and analyst teams in the MIS organization are functioning in [team efforts], and even those who don't function that way will understand that the overall culture of the organization encourages people to come up with ideas and encourages them to work as a team."

"One change I've noticed is that there is *not* a reluctance on the part of employees to take on

Continued on page 16

NEWSPAPER
#630[redacted] 5-DIGIT 48106
#UIV7ZE300M039068# 0010110472
UNIVERSITY MICROFILMS INT 354
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

SECOND CLASS MAIL

IN THIS ISSUE

Revision rumor. Word has it that Cincom has completely rewritten its Supra relational DBMS, with the new version expected to run faster and interface to IBM subsystems. Page 4.

Product eclipse. Hoping to dodge the shadow cast by DEC's prolific rollout, HP inaugurates new PCs, a workstation, a laptop and price cuts. Page 7.

NEWS

4 Norad overhaul program a bomb, auditors say.

6 GM plans to adopt factory fiber optics despite earlier MAP chills.

6 Data General unveils Unix-based multiuser entry-level system.

7 Incompetent doctors diagnosed by government database.

8 DEC's integration strategy is constructed around Decwindows.

8 DEC officials offer clues to software strategies.

10 British bank rolls with AS/400s, Citicorp software.

10 Rivals may pull plug on AS/400 party by mid-year.

12 National DB2 users group coalesces in Chicago.

14 IBM CEO John Akers discourses on his firm's overhaul as well as software and telecom strategies.

15 Akers expounds on Japanese MIS notions.

16 Oracle price for transaction processing rankles some customers.

17 AT&T creates new division to distance Unix software operation.

17 Securities and exchange commission awards contract for electronic filing system.

85 Alliant hardens competitive edge by trimming 20% of work force.

85 MAI claims 50% of Prime stock as it raises volume of hostile overture.

85 Digital Communications Associates president quits.

SYSTEMS & SOFTWARE

23 Cray superpower augments Goldman Sachs' decision-making process.

23 Apollo claims personal super line trounces peers' performance.

23 Japanese telecom company stocks up on Alliant mainframes.

Educom's King on MIS in education. Page 43.

MICROCOMPUTING

29 Ashton-Tate to operate on Dbase's SQL Achilles' heel.

29 Jaguar worksheet compilers sport 1-2-3 compatibility.

NETWORKING

37 Arco stations talk Apple.

37 T1 multiplexers to bear more data burden in next two years.

MANAGEMENT

55 Zucchini pares down Fleet/Norstar DP operations.

55 Corporate MIS cruises high-tech avenues for training.

COMPUTER INDUSTRY

63 AT&T exhibits revitalized interest in competition.

63 Gandalf wields new product strategy in bid to alter image.

63 Japanese female executive is a standout at Ricoh.

Quotable

"If they're good products, we don't care how late they are getting to market."

DEAN ALLEN
LOCKHEED CORP.

See story page 1.

COMPUTER CAREERS

67 MBAs aren't the only ticket to the MIS profession.

TRAINING

80 Managers of training must take time to put their own houses in order.

TRENDS

86 Customers are now looking for more than repairs from vendor service.

EXECUTIVE REPORT

43 Universities strive for A+ in technology. By Glenn Rifkin.

IN DEPTH

51 A complete listing of *Computerworld's* features for 1988.

OPINION & ANALYSIS

19 Kirkley empathizes with MIS managers forced to justify their existences.

23 Gibson mourns passing of intangibles in latest marketing fad.

29 Barney dusts off his official Professor Marvel Crystal Ball.

37 Nolle perceives need for permanent administrators of LANs.

55 Pepelea cuts through the haze enveloping data normalization.

63 Gruenfeld examines the fine print of the new bankruptcy code.

DEPARTMENTS

6 News Shorts

18 Editorial

58 Calendar

75 Marketplace

84 Stocks

86 Inside Lines

Hacker prosecution

Suspect held, denied phone access by district court

BY J. A. SAVAGE
CW STAFF

LOS ANGELES — Deemed a potential threat to society, a suspected hacker has spent more than a month in jail awaiting a late February trial for allegedly defrauding Digital Equipment Corp. and MCI Communications Corp. and transporting proprietary software across state lines.

Kevin David Mitnick, 25, from Panorama City, Calif., could spend up to 30 years in jail and face a $750,000 fine if convicted. The U.S. Attorney's Office said it expects to file a new indictment superseding the above three felonies.

Mitnick pleaded not guilty to all three charges Tuesday. "He's being used as a scapegoat for a lot of hacking," his attorney, Alan Rubin, claimed last week.

Public enemy

Mitnick is being held in a high-security area of Los Angeles' Metro Detention Center. "The court ruled him a risk and a danger to the public," said prosecutor Leon Weidman. U.S. District Court Judge Mariana Pfaelzer refused to allow Mitnick access to telephones, as other inmates have, because the U.S. Attorney's Office is afraid that he may have preprogrammed a computer to trigger programs with a phone call, according to Weidman.

Rubin attributed that restriction to prosecutorial paranoia, saying, "They're frightened of people who understand computers."

In affidavits filed in the case, the Federal Bureau of Investigation is reported to have found an associate of Mitnick's — Leonard Mitchell Di Cicco, an employee at Voluntary Plan Assistance (VPA) in Calabasas, Calif. — who said that Mitnick was illegally accessing DEC systems from a VPA terminal. Telephone charges were "routinely changed by Mitnick from VPA's MCI telephone account to some unknown or nonexistent account."

After Mitnick was arrested Dec. 9, FBI agent Christopher Headrick, with the help of Di Cicco, found an unauthorized copy of DEC's Security Software System stored in a computer in the University of Southern California in November, to which Mitnick apparently had access. "Lots of people have access to USC computers," Rubin noted.

DEC Manager of Investigative Services Chuck Bushey, in part of the affidavit, said that four unauthorized intrusions in DEC's computer system resulted in access to the security software. The intrusions have cost DEC $4 million, according to the affidavit. DEC would not comment on the case.

Mitnick was convicted in 1981 and 1983 of stealing technical information from Pacific Bell and accessing USC computers.

U.S. airports to install employee card system

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — In an effort to beef up security, U.S. airports will be required to install computer-controlled card systems that use magnetic identification cards to control employee access to sensitive areas, according to a new regulation from the Federal Aviation Administration.

The announcement last week was in response to a December 1987 plane crash in California that killed 43 persons; it apparently was caused when a former airline employee opened fire with a gun during the flight. Investigators suspect the worker used his old airport identification card to board the plane.

Computer-controlled card systems can be programmed to keep a record of employees who try to enter areas in which they are not authorized. "They also can reject cards that have been reported lost or stolen or that have not been surrendered by former employees," said Secretary of Transportation James H. Burnley IV.

Computer-card or equivalent systems must be installed at the nation's busiest airports by early 1991, according to the FAA regulation. Information is encoded on a magnetic strip or chip in the cards and then scanned by a card reader at entry points.

About a dozen airports already have effective computer-card systems, the FAA said, but other airport operators complained that the FAA requirement is too hasty and too expensive, especially for smaller airports. The FAA disagreed, saying the average initial cost per airport will range from $56,000 to $1.5 million, depending on the size of the airport.

Systems software for MVS data centers:

Enter the world of total solution, total support.

Computer Associates announces an integrated, total software solution for MVS data center automation: **CA-UNICENTER /II MVS**. It consists of the following **CA-UNIPACK™** modules:

SECURITY, CONTROL AND AUDITING (SCA)
Access control, network security, system audit.

DATA CENTER ADMINISTRATION (DCA)
Problem control, change management, inventory and financial control.

AUTOMATED PRODUCTION CONTROL (APC)
Automating job scheduling, console operations, print management, report distribution.

STORAGE AND RESOURCE MANAGEMENT (SRM)
Tape and DASD management, sorting, disaster recovery.

PERFORMANCE MEASUREMENT AND ACCOUNTING (PMA)
Capacity planning, network management, performance measurement, resource accounting, system analysis.

CA-UNIPACKS are groups of advanced products working together to automate major functional areas of the data center. You maximize productivity when you install all CA UNIPACKS to create CA UNICENTER/II MVS.

Only Computer Associates has the products and expertise to provide MVS data centers with such a cost-effective, total solution.

And only Computer Associates offers **CA-UNISERVICE /II**, a secure link between your mainframe and CA's Customer Service System. 24 hours a day, you get online access to software fixes, interactive problem resolution, plus product tutorials, and more!

Enter the world of total solution, total support. Call Dana Williams today.
800-645-3003 (Ext. 1002)

COMPUTER ASSOCIATES
Software superior by design

- World's leading independent software company.
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers.
- Worldwide service and support network of more than 100 offices.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

Defense project draws fire

BY MITCH BETTS
CW STAFF

They're not likely to make a movie about this.

Five years after the film *War Games* had audiences on the edge of their seats over the deadly escapades of a computer gone haywire at the North American Aerospace Defense Command (Norad), a government report has concluded that Norad's project to build a replacement computer system is over budget, behind schedule and does not meet critical requirements.

Norad, the military's attack-warning center deep within Colorado's Cheyenne Mountain, processes data from a variety of sensors to warn U.S. and Canadian leaders of airborne attacks. The center is in the middle of a $281 million program to replace its aging computer communications system.

Trouble, trouble, trouble

However, the U.S. General Accounting Office (GAO) reported last month that the project has run into big problems. Software for the replacement system is unstable and prone to failures, and restarting the system after a power loss takes an unacceptable 31 minutes, the GAO said.

In addition, the auditors said, the new equipment is incompatible with other Cheyenne Mountain equipment because it uses a different wiring standard; installing new cables will be difficult because of a "rat's nest of cabling under the floor."

The U.S. Air Force said it is addressing all of these problems. According to the Air Force response to the GAO report, the contractor must fix the software at no cost to the government and meet the restart requirement of two minutes for critical circuits and 26 minutes for others.

Norad computers achieved fame in the 1983 hit movie *War Games*, in which a teenage hacker tapped into a hulking Norad supercomputer and started it playing a game of global thermonuclear war. A plot twist gave the computer control of the Norad early warning system, placing U.S. missiles on alert.

The GAO audit concerned the communications subsystem, whose processors control virtually all the digital communications at Cheyenne Mountain. The Air Force has wanted to replace the subsystem since 1981, mostly because it uses old Data General Corp. Nova 840 minicomputers that are hard to maintain. In 1984, the Air Force awarded the replacement contract to GTE Corp. in Stamford, Conn., but the installation date has slipped from 1986 to 1990, and the price has grown from $202 million to $281 million, the GAO said.

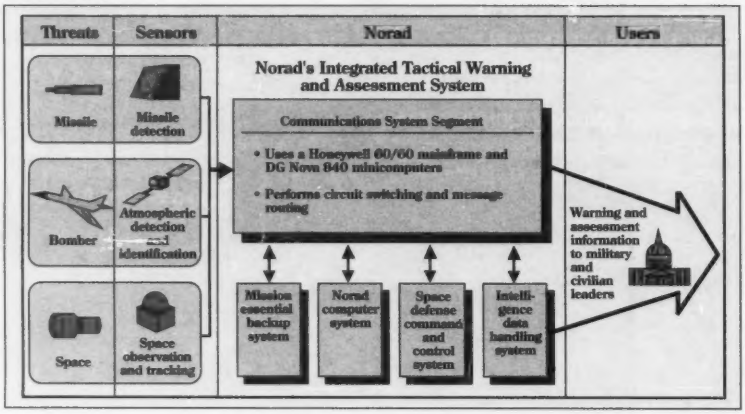
DG no longer makes spare parts for the Nova 840 — a 16-bit mini introduced in 1973 — so Norad personnel have had to make their own parts or salvage them from retired Novas, the audit said. The replacements are expected to come from Stratus Computer, Inc.

Due to delays in the replacement program, the Air Force began a $14 million program of interim upgrades to prolong the old system's useful life, including the replacement of its Honeywell, Inc. 60/60 mainframe with a Honeywell DPS 6000.

The GAO said that because these and other interim measures have improved system performance, much of the bogged-down replacement program may be unnecessary. But the Air Force disagreed, saying a complete replacement is needed because the existing software, written in assembler-level languages, is too costly to maintain.

Early-warning problems

The Norad attack warning system being replaced relies on an antiquated Honeywell mainframe and DG Nova minis



SOURCE: U.S. GENERAL ACCOUNTING OFFICE

Cincom to unwrap Supra upgrade in first quarter

BY JEAN S. BOZMAN
CW STAFF

Cincom Systems, Inc. is expected to unveil by March a completely rewritten version of Supra, its relational database management system, industry analysts briefed by the Cincinnati software firm said last week.

The announcement of Supra Version 2.0, as analysts called it, may come as soon as the first week in February at a database conference on the West Coast, where Cincom officials are scheduled to participate. Cincom executives would neither confirm nor deny the reports.

Some users questioned last week said Cincom told them that Supra 2.0 will run much faster than Supra 1.0. "Supra 2.0 will run above the 16M-byte line under IBM's MVS/XA," one Midwestern user said. "That's a major performance improvement."

This user also expects interfaces to major IBM subsystems, including IBM's VSAM, DB2, DL/1 and IMS.

Most users have signed nondisclosure agreements and declined to provide details about the announcement. Still, some said they are concerned that Supra 2.0 may be marketed as a new product rather than as a less costly upgrade from 1.0.

Tough conversion?

There are also conversion worries. Some users were told this fall that Supra 2.0 might not support Cincom's Total, an older DBMS. "Supra 1.3 gives you a bridge from Total to Supra," one user said. "Supra 2.0 does not have that bridge, so that the Total user is left hanging."

Still, there will be a migration path from Supra 1.0 to Supra 2.0, according to the Midwestern user. "Conversion tools will be provided, because the new version has a different file structure," the user explained. "But users should plan to migrate because, in time, the old version of Supra will go away."

Primary features of Supra 2.0, analysts said, include the following:

- Support for on-line transaction processing (OLTP) operating systems. New maintenance features will allow software changes to be made without interrupting the central CPU engine.
- Support for a wide variety of Unix computers and workstations. Initially, support will be provided for processors from Amdahl Corp., Apollo Computer, Inc. and a few others; the second tier of Unix systems, including Digital Equipment Corp.'s Ultrix operating system and Sun Microsystems, Inc. products, is expected later this year.
- Support for both ANSI SQL and the international SQL standard, which will provide compatibility with IBM's DB2 relational DBMS product.

CORRECTIONS

The charts accompanying the Product Spotlight on IBM and compatible PC products [CW, Dec. 19] gave an incorrect phone number for Relisys. The correct number is 408-945-9000.

Ross Systems was incorrectly reported as holding an approximate 25% share of the Digital Equipment Corp. VAX accounting software market [CW, Nov. 14]. According to market research firm Computer Intelligence, Ross' share of that market increased by 75% between June 1987 and April 1988.

The Dec. 26/Jan. 2 Industry Insight column erroneously included Scientific Computer Systems in a list of "Casualties of 1988." The San Diego-based maker of Cray Research, Inc.-compatible minisupers continued to grow in 1988 and completed an $8.8 million round of venture capital financing in the third quarter.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik

Senior Editors
James Connolly, Management
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Patricia Keefe, Networking
Douglas Barney, Microcomputing
Stanley Gibson, Software
Michael Alexander, Microcomputing
Rosemary Hamilton, Systems

Senior Writers
Nell Margolis
Alan J. Ryan
Amy Cortese
William Brandel

Staff Writer
James Daly

New Products Writer
Sally Cusack

Features Editor
George Harrar

Senior Editors
Glenn Rifkin
Joanne Kelleher, Spotlight and Executive Report
Michael L. Sullivan-Trainor, Special Projects

Senior Writer
David A. Ludlum

Associate Editors
Deborah Fickling
Kelly Shea

Assistant Editor
Sharon Baker

Researchers
Bonnie MacKeil
Kevin Burden

Chief Copy Editor
Steven M. Ulfelder

Assistant Chief Copy Editor
Mary Grover

Features Copy Editors
Julie L. Cook
Joseph J. Fatton

Copy Editors
Cathleen A. Duffy
Richard R. Pastore
Donald St. John
Joyce Chutchian

Art Director
Nancy Kowal

Graphics Specialists
Frank C. O'Connell
John B. York

Graphics Researcher
Laura O'Connell

Graphic Designer
P. Charles Ladouceur

Assistant to the Editor in Chief
Linda Gorgone
Editorial Assistants
Patricia Faherty
Lorraine Witzell
Megan Santosus

Rights and Permissions Manager
Sharon Bryant

News Bureaus
Mid-Atlantic
201/967-1350
Robert Moran, Correspondent

Washington, D.C.
202/347-6718
Mitch Betts, Bureau Chief

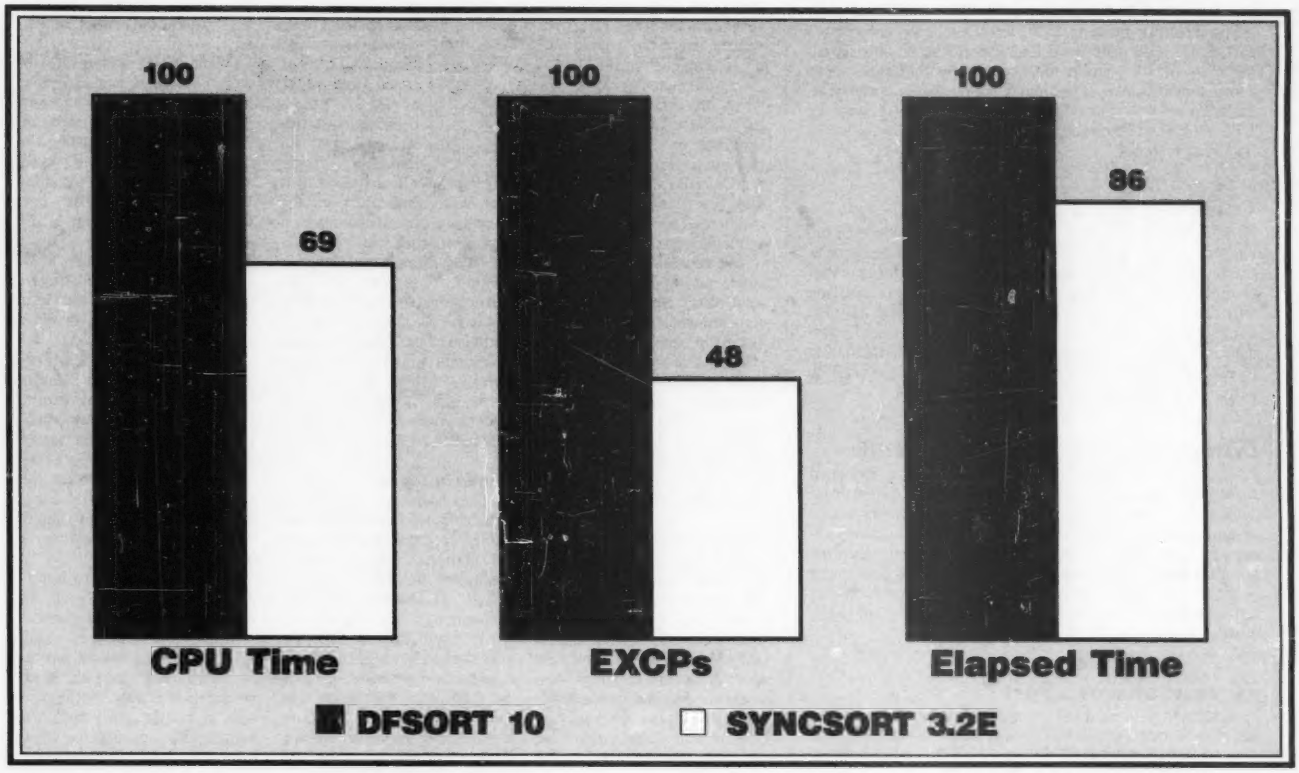
West Coast
415/347-0555
Julie Pitta, Senior Correspondent
J.A. Savage, Correspondent
Mary Elliston, Editorial Assistant

Midwest
312/827-4433
Jean S. Bozman, Bureau Chief

IDG News Service
Kathleen A. Gow, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700

SYNCSORT ESA
vs.
DFSORT
on a
3090 with MVS/ESA



ESA in 1989?
Make a date with SyncSort.

If your plans call for migrating to MVS/ESA and you are still using DFSORT, find out why SyncSort is the better choice.

Call us at **(201) 930-8200** to arrange for a comprehensive benchmark on your system.

syncsort INC.

Where Performance Is the Issue.

© 1989 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675

NEWS SHORTS

Arthur Andersen restructures

Arthur Andersen & Co.'s 2,200 partners approved a restructuring plan last week that places the firm's consulting practice on an equal footing with its traditional tax and audit practices. Starting Sept. 1, Andersen will have two reporting structures to the partnership's chief executive officer — one for consulting and another for the tax and auditing groups. A new chief executive officer will also be elected, replacing current CEO Duane Kullberg, who has held that post since 1980. The moves came in response to pressure from the consulting partners, seven of whom left late last year to start their own practice.

DEC signs with Apollo

Following in the footsteps of IBM and Hewlett-Packard Co., Digital Equipment Corp. has announced plans to license Apollo Computer Inc.'s Network Computing System (NCS) for possible use in future products. NCS, which Apollo has proposed as part of the Open Software Foundation's software environment, is said to provide tools for distributing applications across a multivendor computing network. Apollo, meanwhile, has announced the immediate availability of NCS versions for DEC's VMS and Ultrix and for Sun Microsystems Inc.'s SunOS operating systems.

Comten boosts processor

NCR Comten, Inc. is expected this week to announce an enhancement that reportedly boosts the Comten 5660 communications processor's total throughput to 80% greater than that of IBM's 3745. However, the firm said that the comparison only refers to IBM's single-processor 3745 Model 210 and does not refer to the dual-processor version. The High Performance Feature board is available now and is priced at $60,000. NCR Comten said it will also reduce the 5660's base price by $125,000 to $175,000.

Dataproducts not looking to sell

Printer products supplier Dataproducts Corp. last week issued a statement indicating that it has responded to a takeover inquiry with a letter indicating that the board of directors "is not seeking to sell the company at this time." The company received a letter Dec. 12 seeking a meeting for an acquisition proposal from a representative of a New York investment group holding 5.2% of the company's stock. Dataproducts said last week any acquisition proposal should be submitted to the board in writing.

PC vendor woes Part I

Personal computer price-cutting and competition took a heavy toll on vendors last week. AST Research, Inc. announced it will report a loss for the second quarter ended Dec. 31 because of "the action of competitors who have announced price reductions, particularly on maturing systems." But about $6 million of the $7 million to $9 million loss could result from a charge for the potential sale of AST's Camintonn division, which the company acquired in 1986 for its DEC add-on products.

PC vendor woes Part II

Also troubled in the PC arena is Wyse Technology, which last week announced an impending quarterly loss, the departure of its president, a 15% work-force reduction and a revenue plunge of 50% from year-earlier levels. President and Chief Operating Officer Philip E. White, who joined Wyse from IBM in 1986, left to become CEO of database software vendor Informix Corp. Wyse will reportedly cut 560 jobs; 400 of those cuts are expected to come in Far East manufacturing. In addition, the San Jose, Calif., personal computer and terminal maker said it sought and received waivers from certain financial obligations to its lenders.

Wyse's White

GM to lift fiber MAP ban

BY ELISABETH HORWITT
CW STAFF

DETROIT — General Motors Corp. has finally announced plans to embrace fiber-optic cabling for the factory floor. But this about-face comes several months after the MAP 3.0 standard was frozen in place. As a result, users are likely to face a lengthy wait for fiber-based Manufacturing Automation Protocol networking products.

"We recognize that fiber will be part of the action," said Jack Eichler, GM's director of advanced manufacturing engineering. "We will install it when it becomes part of the MAP standard." That may not be anytime soon because right now, Eichler said, "the connection technology is different depending on which vendor you go to."

But sources both inside and outside of GM complained that a solid, consistent fiber-optic MAP standard would be available now if the top people in GM's MAP effort had supported the effort. Under GM's leadership last summmer, the MAP/TOP Steering Committee finalized MAP 3.0 for the next six years, with fiber-optic cable relegated to an equivocal position in the standard's appendix.

MAP barriers

Until such time as fiber becomes part of the main standard, GM has officially barred the medium from its factory floors, according to Ali Bahroloomi, chairman of GM's MAP Task Force and manager of communications networks at GM's Buick Oldsmobile Cadillac division. Internally at GM, broadband and carrierband are currently the media that should be implemented into manufacturing and industrial applications, Bahroloomi said.

GM spokesmen admitted that the fiber-optic medium has advantages that are uniquely suited to factory networking applications. For example, it has far greater bandwidth capacity and greater resistance to electrical interference and other environmental factors than coaxial cable.

But fiber has gotten no encouragement from GM's MAP leaders in the past, according to Orest Storoschuk, an engineer at GM's Cadillac Pontiac Canada division who has championed fiber-based networking at GM for the past decade. In particular, Michael Kaminski, former MAP project manager at GM, has been consistently pushing broadband cabling over fiber-optics, Storoschuk said.

"It's fair to say that the priority [of MAP leaders at GM] has never been to put fiber into MAP but to get the basic MAP specification in place," said an industry consultant who requested anonymity. "I think the fiber standards effort could have gone faster without compromising this goal."

Group approval

A fiber-based version of the MAP 802.4 Token-Bus protocol gained approval from the Institute of Electrical and Electronics Engineers, Inc. (IEEE) this fall, which "in LANs, is normally tantamount to [becoming] a standard," said Robert Crowder, president of Newark, Del.-based manufacturing consulting company Shipstar Associates, Inc. Final approval from the International Standards Organization is expected in May, Crowder added.

However, "IEEE approval does not mean it has to be part of the MAP specification; they recommend a lot of things," Bahroloomi said. The 802.4H specification is now part of the MAP 3.0 appendix, but vendors are not required to include appendix items in their products in order to be MAP-compliant, Crowder said.

"Shipstar can already build a fiber-based MAP network now" based on available vendor products, but an appendix "does not carry the same level of endorsement of fiber-optic technology" that would encourage other vendors to enter the market, he added.

While MAP leaders at GM were officially banning fiber from the company's factory floors, the Chevrolet Pontiac division was quietly installing the forbidden medium on its local-area networks — including three fiber-based MAP networks that are currently in the works.

The networks employ MAP controller cards from Ungermann-Bass, Inc. and fiber-optic modems from Thomas & Betts Corp. in Bridgewater, N.J.

But Chevrolet Pontiac's fiber-based MAP projects are definitely the exception that proves GM's no-fiber rule, according to Storoschuk. The division started using fiber before MAP was defined, in 1979. Then when the standard came along, GM Canada received permission to implement it on top of its existing cable.

"If Oshawa asked to implement fiber now, no one would let them do that," Bahroloomi said.

Right now, GM is working with vendors to ensure interoperability of fiber-based MAP products. It is also "in the process of testing [fiber-optic cabling technology's] pros, cons, strengths and weaknesses," Eichler said.

Unix goes to entry level on DG 16-MHz Dasher

BY JAMES DALY
CW STAFF

WESTBORO, Mass. — Data General Corp. furthered its commitment to a Unix product line last week with the introduction of an entry-level, multiuser Unix system based on its Dasher/386 personal computer.

The Dasher/386 Unix platform will incorporate a 16-MHz Intel Corp. 80386 microprocessor, is compatible with the IBM Personal Computer AT and uses the 386/IX product set developed by Interactive Systems Corp.

The 386/IX product set is based on the AT&T-certified Unix System V/386 Revision 3.0.

The system features two of the University of California at Berkeley Unix 4.2 facilities: the C shell, which is a command-language interpreter; and Sendmail, a general-purpose, internetwork mail-routing facility.

The Dasher/386 Unix system supports up to 16M bytes of systems memory in 1M- or 4M-byte increments and offers up to 318M bytes of internal disk storage. Also provided will be intelligent eight-line serial controllers, which allow up to 25 asynchronous serial connections.

The Dasher/386 Unix system with 40M bytes of disk storage, 4M bytes of memory and a 386/IX runtime operating license is priced at $7,320. The same system with 70M bytes of disk storage costs $8,020.

The products reportedly will be available next month.

In a related announcement, DG made public the signing of an agreement with Framingham, Mass.-based Language Processors, Inc. (LPI). Under the terms of the pact, DG will offer LPI's 32-bit compilers on the Dasher/386.

HP combats DEC with low-end intros

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Apparently vying for attention with Digital Equipment Corp., Hewlett-Packard Co. today is scheduled to introduce a bevy of products and announce price cuts.

Two high-end deskside personal computers based on Intel Corp.'s 80386 processors, an entry-level three-dimensional graphics workstation and a Zenith Data Systems Corp.-based laptop are scheduled for introduction today by HP, company officials confirmed last week. Additionally, the company plans to announce price cuts on three of its workstations, cutting the cost of 6-month-old Model 360SRX nearly in half.

It is no coincidence that HP's announcement coincides with DEC's desktop barrage this week (see story page 1), indicated John Logan, vice-president of the Aberdeen Group in Boston. "HP is jumping up and down to be compared to Digital," he said. "The company is realigning its price/performance to look better than DEC." Logan said he also expects HP to release benchmarks against DEC this week that "look intriguing."

Target: DEC

Hitting DEC directly, HP now offers a software package that converts VAX applications written in Fortran to be used on HP's Series 800 reduced instruction set computing (RISC) Unix-based machines.

The high-end PCs are the upper extensions of HP's Vectra line. The RS/25 uses Intel's 25-MHz processor and its 82385 cache controller. The Model RS/20 uses a 20-MHz chip. Because of the cache controller, the computer will run about 40% faster than earlier models on memory-intensive applications, according to Marlin Miller, HP product manager.

HP has carried an RS/20 since February 1988 at prices similar to the new models', which begin at about $7,500. While the older models had more main memory at the low end — 2M bytes on the Model 150 vs. 1M byte on the new Model 150E — the old models had no cache controller.

HP is set to make announcements in several product categories:

Laptops. Capitalizing on the popularity of Zenith's laptop, based on an Intel 80286 processor, HP said it is now retailing the Zenith machine under its logo with only slight additions in software.

The laptop, called the Vectra LS/12, has either a 20M- or 40M-byte hard disk at prices slightly higher than Zenith's, $4,879 and $5,479.

Workstations. Expanding its line of Motorola, Inc. 68030-based workstations, HP announced a low-end graphics workstation priced at $14,900. The Model 340SRX competes directly with Silicon Graphics, Inc.'s Personal Iris, introduced in October, and will cost $15,000.

Price reductions are also set to be announced today on three of HP's Motorola processor-based and HP's own RISC architecture workstations. A 42% price reduction will be granted to the mid-range 68030-based Model 360SRX, knocking the price from $34,965 to $19,900. The high-end Model 370SRX is due to get a 17% reduction to $41,000. Both were introduced midyear 1988.

VAX conversion software. A $10,000 conversion program for VAX applications written in Fortran to HP 3000 Series 800 multiuser RISC-based Unix computers is scheduled to begin today. The software tools alone can be obtained for $2,000, according to a spokesman.

Feds to track suspect docs

WASHINGTON, D.C. — The U.S. government is creating a nationwide database to help hospitals and medical licensing boards keep track of quacks.

The U.S. Department of Health and Human Services awarded a $15.9 million contract to Unisys Corp. Dec. 30 for the computer system, which the agency said is "intended to lessen the possibility that incompetent physicians and dentists may move their practices from state to state without detection."

The National Practitioner Data Bank was authorized by the Health Care Quality Improvement Act of 1986 and is expected to be operational this summer.

The database — consisting of disciplinary actions, peer-review reports and malpractice claims — will provide a screening tool for hospitals and other organizations that hire doctors.

Members of Congress praised the department for implementing the law. "In the past, incompetents have been able to slip through the cracks and inflict poor medical care on the American consumer," said Rep. Ron Wyden (D-W.Va.).

Access to the database will be limited to hospitals, group medical practices, state licensing boards and individual doctors. The public will not have direct access, due to privacy safeguards, but consumers are the ultimate beneficiaries of the system, said spokesman Frank Sis.

MITCH BETTS

VSAM DATA COMPRESSION
Without the CPU Overhead
IAM REDUCES THE SIZE OF YOUR VSAM FILES BY 30 TO 70%

IAM'S FILE STRUCTURE — SAVES 20 TO 40%
IAM uses an advanced file structure which is far superior to VSAM. IAM's supercompressed index, freespace concepts and blocksizes make much more efficient use of disk space.

IAM'S DATA COMPRESSION
SAVES AN ADDITIONAL 20 to 50% DASD SPACE
Most files contain records with unused fields or repeating sets of characters. When IAM applies its proprietary compression techniques, the result is an additional 20 to 50% reduction in file size.

IAM's CPU time is dramatically less than competing compression products. In fact, since IAM's CPU time is normally much less than VSAM, IAM with data compression takes less CPU time than normal VSAM processing.

TRANSPARENT
Online systems (CICS), BATCH jobs, TSO, SMP/E and other applications make extensive use of key indexed VSAM (KSDS) files.
IAM is a transparent alternative to VSAM KSDS files, which substantially reduces the impact of VSAM processing in your installation. There are no modifications to programs or JCL to use IAM files in place of VSAM.

AUTOMATIC RELEASE OF UNUSED SPACE
IAM takes the guessing game out of VSAM space allocation. Large amounts of disk space are wasted when users overestimate how much space VSAM requires or how many records a file will contain. VSAM cannot release overallocated space.

Solution #3
The Incredible Shrinking Machine

FREE VSAM SPACE SAVINGS ANALYSIS*

SPACE SAVINGS

DATA SET NAME	VSAM TRKS ALLOC	VSAM TRKS USED	IAM TRKS STD	IAM TRKS COMPR	% SAVINGS STD	% SAVINGS COMPR	TOTAL RECORDS	AVERAGE LARGEST	MAX LRECL
BIG.CLUSTER	37155	37155	27855	15600	25	58	4754670	233 502	580
CICS.FILE.MASTER. TABLE.CLUSTER	21000	19005	12720	9495	33	50	5068165	150 150	150
NAME.ADDRESS.FILE	9315	8985	6465	1875	28	79	428529	680 2090	2090

The VSAM simulation report displays the current size and data characteristics of your VSAM files and how much space IAM will save you with and without data compression.
*To see your VSAM usage, send for INNOVATION's free VSAM reporting programs.

Call for a Free No Obligation 90 Day Trial
Supports MVS, MVS/XA and MVS/ESA
Makers of FDR and ABR

INNOVATION DATA PROCESSING
275 Paterson Avenue, Little Falls, NJ 07424 • (201) 890-7300

Decwindows to cement integration strategy

BY STANLEY GIBSON
CW STAFF

Digital Equipment Corp's massive desktop announcement tomorrow will be the coming-out party for Decwindows, the cornerstone of an integration strategy that DEC hopes will carry it to the No. 1 position in the workstation market.

Decwindows is part of a larger connectivity concept under which DEC hopes to glue together disparate operating systems in a seamless environment. The concept is analogous to IBM's Systems Application Architecture (SAA).

It was unclear last week when DEC plans to unveil the full connectivity scheme, known as Applications Integration Architecture (AIA).

"AIA is an antidote to SAA. Its advantage is that it includes Unix," said Terry Shannon, director of the DEC Advisory Service at International Data Corp., a market research firm in Framingham, Mass. IBM has made it clear that its SAA and Unix offerings will remain separate.

"The Decwindows-AIA strategy will enable DEC to sell into new accounts by integrating non-DEC personal computers and workstations. In such accounts, DEC will own the network, and the vendor who owns the network controls the account," Shannon said, summarizing DEC's strategy.

Even though Decwindows quietly began shipping in December with DEC Ultrix 32 Version 3.0, DEC will make its formal announcement of the offering tomorrow, complete with pricing and availability.

Triple whammy

DEC will add Decwindows to VMS Version 5 in a new release and will announce Decwindows for Microsoft Corp. MS-DOS, which will be offered with DEC's Tandy Corp.-made PCs. Thus, Decwindows will run on all three operating systems for which DEC is announcing hardware: MS-DOS, Ultrix and VMS.

But while DEC is embracing MS-DOS and Unix on the desk top, Apple Computer, Inc.'s Macintosh, which apparently had a key role in DEC's desktop strategy last year, is going to be absent from tomorrow's festivities, DEC officials confirmed.

One reason for its absence could be that Macintosh windowing is different from Decwindows, although Shannon claimed that DEC engineers have had Decwindows running on a Macintosh for six months.

At the announcement, DEC will showcase some 80 developers who have been working on applications that use Decwindows. About 20 applications will be ready to ship immediately, DEC Vice-President Peter Smith said.

Decwindows will also reflect the glory of the Open Software Foundation's recent selection of the Decwindows tool kit for development in its Graphical User Interface for its OSF 1.

DEC's game plan

In a briefing last week, DEC officials offered some insights into various software strategies, including the following:

- The announcement tomorrow includes an MS-DOS compatibility software package for VMS intended mainly for the Vaxstation 3100 (PVAX). The package will allow MS-DOS to run under VMS in multitasking mode.
- DEC will "program-announce" All-In-1 with Decwindows. That is, it will not announce pricing and availability right away but will say that work is being done to build an All-In-1 version with a Decwindows interface.
- DEC is changing its attitude about Unix. The new approach is to "just say yes. If people ask for Unix, we say yes," said Don McInnis, DEC vice-president. Previously, DEC pushed VMS.
- Symmetrical multiprocessing will not be announced with Ultrix next week. How soon DEC will announce symmetrical multiprocessing with Ultrix "depends somewhat on OSF developments," McInnis said, although he claimed DEC's strategy is not tied to what the OSF does.
- Over time, DEC will bring Decwindows to an IBM Presentation Manager look and feel, following the OSF's lead.
- OS/2 will not be offered right away with the PC products. That would be contingent on bringing Decwindows to OS/2. MS-DOS 3.3, rather than OS/2, will be sold with the DEC PCs.
- The unsophisticated user will be able to bring up VMS on a workstation and manage it using icons.
- A version of VMS with Posix compliance in kernel mode is reportedly coming, although no more specifics were offered.

STANLEY GIBSON

DEC

CONTINUED FROM PAGE 1

brows is code-named PMAX. The machine is a high-performance technical workstation based on Mips Computer Systems, Inc.'s R2000 reduced instruction set computing microprocessor, making it DEC's first significant product since Rainbow to use a non-DEC CPU.

The PMAX is expected to process 10 "VAX units of performance," or VUP (a VUP equals approximately one MIPS), making it a challenger to Sun's Sun-4/260 workstation. The machine could also significantly undercut the Sun-4/260's price tag, which has a base price of nearly $40,000. Terry Shannon, director of Framingham, Mass.-based International Data Corp.'s (IDC) DEC Advisory Service, said, "it would not surprise me to see DEC offer RISC MIPS at $1,000 a piece.

Halt the exodus

Steve Blank, a cofounder of Mips Computer Systems who now heads the marketing department at Ardent Computer Corp., said DEC's inclusion of the R2000 could bite into the market share of workstation makers such as Prime Computer, Inc. and Silicon Graphics, Inc. Blank said these vendors have been "fighting over the dead bodies of Microvaxes and VAXs. DEC customers could put up with DEC's lousy performance for only so long, then they looked elsewhere. I think this could stop that sort of attrition."

The PMAX will run only DEC's Ultrix operating system, rather than its VMS.

Another key hardware cog will be a relabeled Tandy Corp. personal computer that is likely to use Microsoft Corp.'s MS-DOS operating system and Intel Corp.'s 80286 and 80386 microprocessors. The 80386-based model will also support OS/2.

The release of this PC will also signal the eventual phasing out of the Vaxmate and Vaxstation 2000, a DEC official indicated. "Over time, both will be replaced by the new products," said Pete Smith, vice-president of DEC product marketing, at a recent briefing. Some analysts predicted the phaseout could begin this fall.

Heading the list of internally developed products will be the PVAX, a low-end commercial workstation based on DEC's CVAX processor that will run approximately 2.4 VUPs. The VMS and an Ultrix-based machine will be the first DEC workstation to incorporate 3½-in. peripherals and is expected to compete with the Sun-3/60 workstation.

Also arriving will be the Firefox machine, DEC's second-generation mid-range workstation. The two-processor Vaxstation 3520 and four-processor Vaxstation 3540 will offer approximately 5 and 10 VUPs, respectively. While it is expected to be a VMS-only machine at announcement time, Ultrix symmetrical multiprocessing support is likely to be forthcoming. A diskless model is also expected.

DEC will also promote a series of software products intended to tie into an announced connectivity scheme called Applications Integration Architecture, an umbrella name for adjuncts to heterogeneous systems, and Decwindows (see story above).

All the products are scheduled to be available within three months and are predicted to favorably impact the third and fourth quarters of DEC's fiscal year.

Although the amount of product introductions could take users aback, some analysts said they think the scope is appropriate. "Once a customer goes to another supplier to buy something, you never know what their next move will be," said Jay Stevens, an analyst at Dean Witter Reynolds, an investment firm in New York. "They should have done [the announcement] years ago."

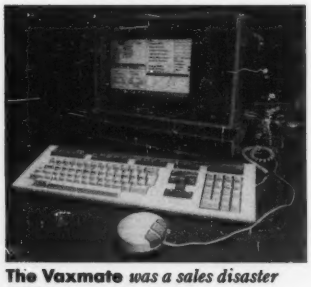
Another burning question DEC must face is whether the products come too late to sway firmly entrenched workstation users. Both Sun and Apollo already enjoy significant market share and customer loyalty.

"I think DEC is wielding a sharp sword here, but it better be careful it doesn't cut off its own foot," said Bob Hambrecht, a senior technology analyst at Hambrecht & Quist. "You have to be very careful when you start competing with someone by copying him."

But even entrenched products can be dug up. "If they're good products, we don't care how late they are getting to market," said Dean Allen, vice-president for information services at Lockheed Corp. in Calabasas, Calif. "Right now, we've got all types of workstations, but if the new DEC machines give us the kind of price/performance we're looking for and we can put it into our environment transparently, we're going to do that."

A further curve could be thrown DEC's way by Sun and IBM. Sun is due out with a low-end system, based on its Scalable Processor Architecture, that will clock in at about 7 MIPS and could cost less than $10,000, said Vicki Brown, director of systems research at IDC, while rumors have been circulating that IBM will release a high-performance version of its Personal Computer RT workstation.

Senior Editor Rosemary Hamilton contributed to this report.



The Vaxmate *was a sales disaster DEC hopes not to repeat*

Advancing forces

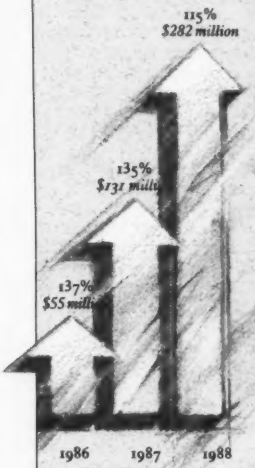
Intending to raise the competitive stakes in the battle for the desk top, DEC is expected to announce a broad range of workstation products next week

Reported codename (expected product name)	Expected features
Firefox (Vaxstation 3520, 3540)	• Based on Vax 6200 multiprocessor series • VMS • Successor to Vaxstation/GPX II • 2- or 4-processor configurations • Estimated 6 or 11 MIPS
PMAX (Decstation 3100)	• Based on Mips Computer Systems' RISC-based multiprocessor • Ultrix-only • Estimated 10+ MIPS
PVAX (Vaxstation 3100)	• Based on Microvax 3000 microprocessor series • Ultrix, VMS or MS-DOS emulation
Shackmate (Decstation 210, 316, 320)	• Based on Tandy's Intel-based 80286 and 80386 microcomputers • MS/DOS

CW CHART

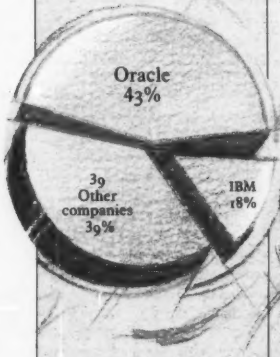
Can you name...

The world's fastest growing company?



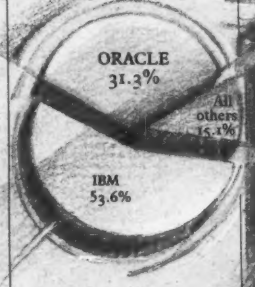
No other Fortune 1000 company is growing as fast as Oracle.

The world's largest relational DBMS company?

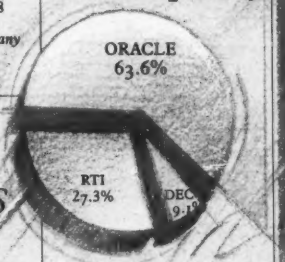


Oracle is more than twice as large as its closest competitor. (Source: Donaldson, Lufkin & Jenrette Action Recommendation, July 18, 1988)

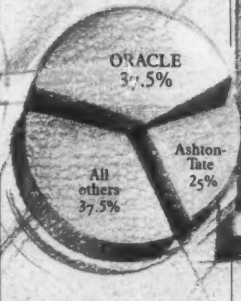
The only software product in history that has been a success on mainframes,



minicomputers,



and PCs?



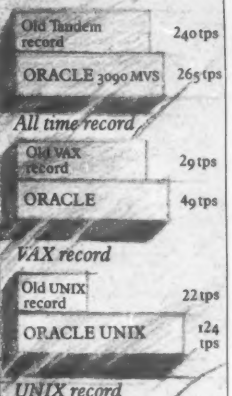
ORACLE is the only software in the world that lets you connect all your computers and share data. (Source: DATAMATION survey of IBM and IBM-compatible mainframe sites, 8/15/88)

The number one major software company* in customer satisfaction?

Rank	Product • Company
1	*ORACLE* • Oracle
2	*System 1032* • Compuserve
3	*Adabas & Natural* • Software AG
4	*Model 204* • CCA
5	*RDB* • DEC
6	*Ingres* • RTI
7	*Focus* • IBI
8	*Unify* • Unify
9	*Nomad2* • Must Software
10	*Supra* • Cincom
11	*Access DB* • ADR
12	*Ramis* • On Line Software
13	*Easytrieve* • Pansophic
14	*IDMS R* • Cullinet
15	*VAX DBMS* • DEC
16	*Informix SQL*
17	*SQL/DS* • IBM
18	*Inquire* • Infodata Systems
19	*Mantis & Ultra* • Cincom Systems
20	*System 2000* • SAS
21	*DB2* • IBM
22	*DL1* • IBM
23	*IMS* • IBM
24	*Answer DB* • Answer Systems

ORACLE has the highest customer satisfaction rating of any major data management software product. The people have spoken. (Source: DATAPRO survey results, August 1988)

The world's fastest relational database management system?



The ORACLE DBMS holds the performance record in every major computer environment—IBM MVS, VAX/VMS and UNIX. Audited benchmark results are available upon request.

ORACLE is the only database software that runs on mainframes, minicomputers and PCs. Number one in performance. Number one in customer satisfaction. That's why people keep choosing ORACLE. And the company keeps growing. Faster than any other company in the world.

47 of the top Fortune 50 use ORACLE. So do most of the remaining Fortune 500. So if you need a DBMS. that lets you connect all your computers, register for the next free Oracle seminar in your area. Call 1-800-345-DBMS. You won't be the first.

U.S. SEMINAR SCHEDULE

AK	Anchorage	Feb 6*af*
AL	Birmingham	Mar 8*r*
	Huntsville	Feb 7*g*
	Montgomery	Feb 23
AR	Little Rock	Mar 16
AZ	Phoenix	Feb 7*cfm*
	Scottsdale	Mar 9*a*
	Tucson	Feb 14
CA	Costa Mesa ... Feb 23*av*	Mar 23*m*
	La Jolla	Feb 9*am*
	Los Angeles ... Feb 16*acv*	Mar 14*fm*
	Ontario	Mar 21*fm*
	Oxnard	Feb 2*fm*
	Sacramento	Mar 21*f*
	San Diego	Mar 16*cf*
	San Francisco ... Feb 15*apv*	Mar 29*cf*
	Santa Clara ... Feb 9*at*	Mar 9*fv*
CO	Colorado Springs	Feb 22*r*
	Denver	Mar 30*g*
	Englewood	Mar 7*afp*
CT	Farmington	Mar 7*f*
	Stamford	Mar 21*fm*
DC	Washington ... Feb 16*g*	Mar 16*g*
FL	Boca Raton	Feb 7*fm*
	Ft. Lauderdale	Mar 8*t*
	Orlando	Feb 9*g*
	Pensacola	Feb 22
	Tampa	Mar 22*fv*
GA	Atlanta	Mar 23*r*
	Savannah	Feb 16*p*
HI	Honolulu	Mar 14*fp*
IL	Chicago... Feb 22*a** Feb 28*fm*	Mar 21*fr*
	Springfield	Feb 14*c*
IN	Indianapolis ... Feb 21*ac*	Mar 22*fm*
KS	Wichita	Feb 16*t*
KY	Lexington	Mar 21*c*
	Louisville	Feb 7*r*
LA	New Orleans	Mar 31*am*
	Shreveport	Feb 16*r*
MA	Burlington	Mar 15*af*
	Worcester	Feb 8
MD	Baltimore	Feb 7*t*
	Bethesda	Mar 9*ga**
	Columbia	Mar 15*p*
ME	Portland	Mar 2*f*
MI	Dearborn	Feb 7*ft*
	Grand Rapids	Mar 8*fm*
	Lansing	Feb 14*fp*
	Troy	Mar 7*fm*
MN	Minneapolis ... Feb 15*cr*	Mar 14*fp*
MO	Kansas City	Mar 23*ap*
	St. Louis ... Feb 9*t*	Mar 9*fm*
NC	Charlotte	Mar 22*c*
	Greensboro	Feb 15*r*
	RTP	Mar 7*r*
NH	Bedford	Mar 14
NJ	Iselin ... Feb 15*fv*	Mar 30*fm*
	Princeton ... Feb 15*t*	Mar 15*f*
	Secaucus	Mar 2*f*
NM	Albuquerque	Mar 7*f*
NY	Amherst	Mar 28*ap*
	Fairport	Feb 9*fv*
	Melville ... Feb 15*v*	Mar 15*fv*
	New York City ... Feb 7*av* Feb 22*f*	Mar 8*v* Mar 22*f*
OH	Akron	Feb 1*f*
	Beachwood	Mar 7*r*
	Cincinnati	Mar 23*fv*
	Columbus	Mar 9*f*
OK	Oklahoma City	Feb 8*fm*
	Tulsa	Mar 15*t*
OR	Portland	Mar 14*fm*
PA	Harrisburg	Feb 9
	King of Prussia	Mar 31*r*
	Philadelphia	Feb 6*fv*
	Pittsburgh	Mar 15*fv*
	Scranton	Feb 15*fp*
RI	Providence	Feb 2*f*
SC	Charleston	Mar 9*fr*
	Columbia	Mar 23*m*
	Greenville	Feb 8*f*
TN	Knoxville	Feb 8*r*
	Memphis	Feb 16*c*
	Nashville	Mar 15*r*
TX	Austin	Mar 2*r*
	Dallas ... Feb 1*fv*	Mar 7*cf*
	Houston ... Feb 9*fv*	Mar 9*afp*
	San Antonio ... Mar 3*f*	Mar 28*g*
UT	Salt Lake City ... Feb 1*f*	Mar 16*m*
VA	Richmond	Feb 22*c*
	Roanoke	Feb 2
WA	Seattle ... Feb 21*fv*	Mar 29*av*
WI	Madison	Feb 22*f*
	Milwaukee	Mar 8*f*

For Canadian Seminars

Call (800) 387-4407, except in Quebec, call (514) 337-0755.

The following key indicates additional afternoon seminars that are offered with these seminar dates:

a Integrating MacIntosh into Corporate Network
c CASE Tools
f Oracle Financials
m Computer Integrated Manufacturing (CIM)
p PC Workgroup Solutions
r SQL*Reportwriter
t ORACLE Transaction Processing
v Value Added Relicensors (VARs)

Please note:

g These seminars are directed to the Federal Government only
* Only the indicated afternoon seminar is held on these dates

Attn.: National Seminar Coordinator
Oracle Corporation • 20 Davis Drive
Belmont, California 94002

1-800-345-DBMS, ext. 8121

☐ My business card or letterhead is attached. Please enroll me in the *FREE* ORACLE seminar to be held

at: _____

on: _____

COMPUTERWORLD

*Sales over $10 million. Copyright © 1988 by Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. IBM, RTI, DEC, Ashton-Tate, Tandem, VAX, UNIX and other company- or product names mentioned are trademarks or registered trademarks of their trademark holders. TRBA

ORACLE®

THE HARDWARE-INDEPENDENT SOFTWARE SOLUTION

Call 1-800-345-DBMS, ext. 8121 today.

20 Davis Drive, Belmont, CA 94002 • World Headquarters (415) 598-8000 • Oracle Canada (800) 387-2622 *(except Quebec)* • Quebec (514) 337-0755 • ORACLE Systems Australia 61-2-959-5080 • ORACLE Europe 44-1-948-6911 • ORACLE Systems Hong Kong 852-5-266846

UK bank invests in AS/400s

Spends $20M, also procures PS/2s, Citicorp banking software

HFC Bank PLC in London is forking over $20 million to IBM and Citicorp Information Resources for a banking system based on 190 IBM Application System/400s and 1,500 IBM Personal System/2s.

The joint sale by IBM and Citicorp was announced last week. By 1990, HFC said it expects to have implemented the AS/400-based network, which will run the Citicorp Comprehensive Banking System.

While this is not the largest single sale of AS/400s, it is the largest sale of the mid-ranges intended for a single private network, an IBM spokesman said.

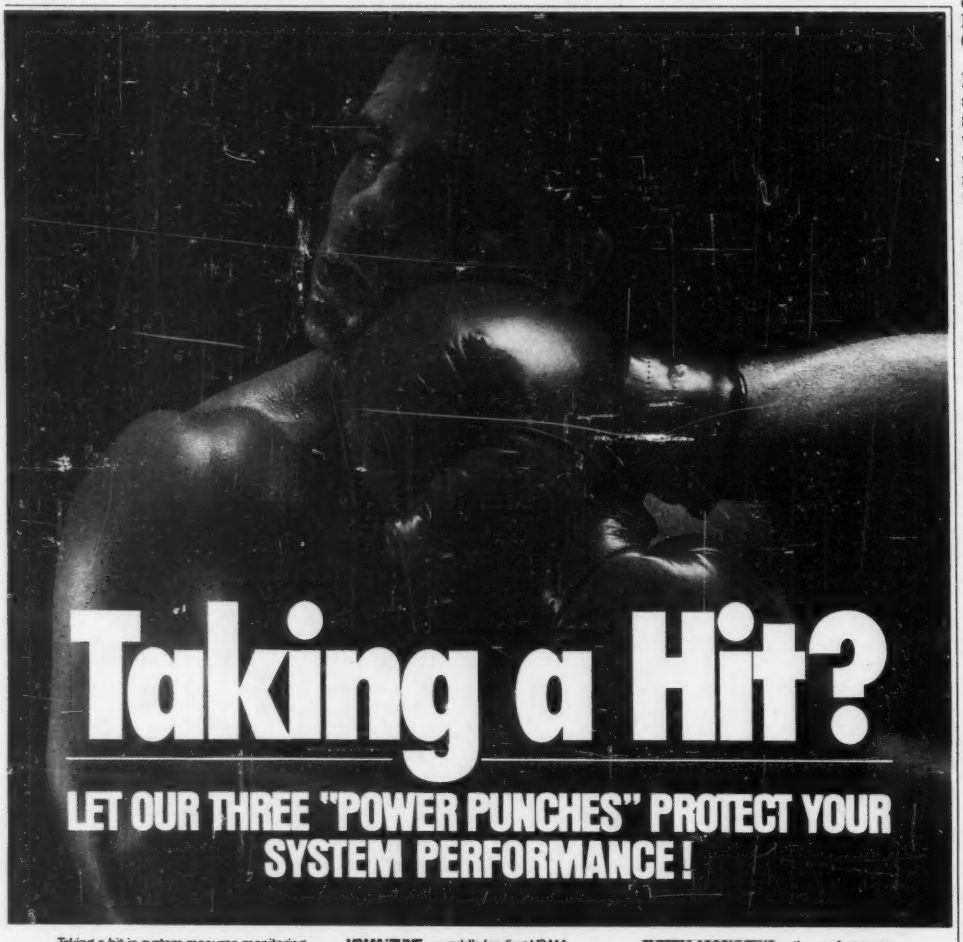
The distributed system will replace an aging IBM mainframe system that ran banking software designed by HFC. According to a published statement, the bank will scrap its batch-oriented software and remove the mainframe to make way for the AS/400s.

HFC conducted a two-year study of banking systems and tested the Citicorp banking software before signing the contract, the companies said.

The system is part of HFC's strategy called Project 90, an aggressive plan to increase its customer base from the current 300,000 to one million accounts during the next several years.

The goal is to have a PS/2 for nearly every bank employee who deals directly with customers. The PS/2s will be linked to the AS/400s, which will be located in the bank's 172 branch offices in the UK. The Citicorp software was recently tailored to take advantage of the AS/400 architecture, Citicorp said. The heart of the system is a database called Common File, from which all the banking applications run.

Citicorp will set up a link for diagnostic purposes from its headquarters in Orlando, Fla., to HFC facilities in Windsor and Birmingham, England.



Taking a hit in system resource monitoring and accounting?

VPAC—the unbeatable VM performance analyzer that puts automatic control of resource allocation at your fingertips, providing you with:
- graphic displays and comprehensive reporting
- early detection of system bottlenecks
- continuous exception monitoring
- dynamic control of system resources
- XA support

VSAM/TUNE—world's leading VSAM management and performance tool that:
- tunes clusters for optimum I/O performance
- dynamically allocates buffers
- provides on-line analysis and modeling
- plans and simulates for system growth without impact
- simplifies IDCAMS listings and generates control statements
- offers a single-product solution without the hassle of multiple VSAM software packages

SYSTEM ACCOUNTING—the perfect partner for the DOS/VSE environment with comprehensive analysis that supplements IBM data with accurate statistics, giving you:
- comprehensive optimization tuning
- detailed load monitor and capacity planning
- precise accounting for both CICS applications and system resources

Look to these Macro 4 "power punches" when your needs call for total precision in system performance monitoring.

TUBES: World's Best Session Management Tool • CICSPRINT Spooling Package for CICS, JES and Power
DUMPMASTER: Dump Management and Analysis Package • LOGOUT: Premier Console Manager for DOS/VSE

Macro 4
Systems Software
Brookside Plaza, P.O. Box 187, Mt. Freedom, NJ 07970
(201) 895-4800 • (800) 223-0414

INTERNATIONAL OFFICE: MACRO 4 PLC Crabbet Park House, Turners Hill Road, Worth, Crawley, West Sussex, RH10 4SS England (0293)886060
OTHER OFFICES: France, Italy, Switzerland, Belgium, West Germany, Netherlands, Spain, Scandinavia, Israel, Australia, Japan and Pacific Basin.

WE'LL HELP YOU DELIVER YOUR OWN KNOCK OUT PUNCH!
CALL 800-223-0414
AND PUT THE POWER OF MACRO 4 IN YOUR CORNER.
We've been providing powerful solutions to MIS system problems on an international scale since 1968—with a full range of software solutions for VSE, VM and MVS operating system requirements.

HP, DEC will try to tarnish AS/400 shine

BY ROBERT MORAN
CW STAFF

IBM's Application System/400 has been wildly successful, with users buying the machines as fast as they can be built. But opinions differ on whether the honeymoon will extend past midyear, when the mid-range offering will face its first taste of real competition from rivals Digital Equipment Corp. and Hewlett-Packard Co.

According to a study done by ADM, Inc. in Cheshire, Conn., IBM sold 32,000 systems in 1988. Those sales translate into approximately $5 billion in revenue, with nearly half that amount derived from the European market. Worldwide AS/400 installations are projected to increase to 98,000 in 1990 and 125,000 in 1991.

ADM predicts a good 1989 for the AS/400. The firm justified this prediction by citing the continued pent-up demand within the IBM System/36 and 38 marketplace, the refinement of U.S. sales channels and the completion of the 1988 sales cycle for organizations that began looking at the system during the latter half of last year.

Not so flowery

But not everyone sees such a rosy picture for the IBM system. John Logan, executive vice-president of the Aberdeen Group in Boston, claimed that by midyear, IBM will be forced to engage in a toe-to-toe battle with HP's Spectrum 9000 series and DEC's symmetric multiprocessing machines.

According to Logan, such contests will result in a leveling off of AS/400 sales, largely because the machine has a relatively poor reputation for performance, specifically when called on to run two or more applications.

"When the industry moves toward comparative analysis based on application solutions and price/performance, the AS/400 will find itself on shakier ground," Logan said.

However, ADM President David Andrews said he believes that once the pent-up demand falls off, power boosts to the AS/400 for both the larger and smaller models will keep sales moving.

This year, Andrews said, IBM will add functionality to allow the AS/400 to serve as a control point for intelligent workstations; in 1990, IBM will bring artificial intelligence, voice and data integration and image processing to the platforms.

Logan attributed the success of the AS/400 at least in part to timing. He said the industry is experiencing a turnover in mid-range computers that were purchased in 1984 and are now outdated in office functionality and not worth maintaining.

The first replacements affect the old IBM System/34, 36 and 38 as well as the DOS/VSE marketplace. According to Andrews, at least half the DOS/VSE users will migrate to the AS/400 because rewriting an application on the AS/400 is less expensive than porting it to the MVS operating system.

2001 MARCUS AVENUE
LAKE SUCCESS, N.Y. 11042
TELEPHONE (516) 328-7000
FAX (516) 354-4015
TELEX 6973556

Software Engineering of America

COMPANY PROFILE

Dear Mainframe User:

We, at Software Engineering of America, have created this letter at the request of a large number of mainframe users. In light of all the turmoil brought about by the current spate of mergers and acquisitions, many of you have told us that you are interested in the plans and intentions of the companies with which you do business. Since one of our main goals is keeping in tune with the concerns of the user community, we are more than willing to comply.

SEA was founded in February 1982 by a group of professionals with a long history of involvement in the computer industry. The founders brought with them a broad range of expertise in the development and support of high-quality software systems, obtained through experience in industry, government and leading software companies.

The principles upon which SEA was founded are the following:

- To produce a diverse line of integrated system software products, developed and enhanced based on user requirements.
- To provide first-rate support for those products-24 hours a day,7 days a week.

Strict adherence to these very basic principles have propelled SEA from a 1982 startup to our current position of over 6000 licensed users in more than 40 countries. With a consistent ranking in Software Magazine's "Top 50 Independent Software Vendors", SEA has emerged as a leader in the systems software market.

SEA PRODUCT GROUPS

Operations Management

SEA provides a complete line of operations management solutions covering all critical areas, including job scheduling, master console management, report archival, report management and distribution, JCL checking and management, message management, and the complete viewing, archival and retrieval of all types of Sysout and Syslog.

We are the only company that provides such a complete line of operations management software, backed-up by first-rate technical support. With over 2,500 users choosing SEA as their single source for operations management software, SEA has assumed a position of leadership in the field. Many users tell us the reason they have selected our products is superior support, as well as our integrated approach to long term product development.

DASD/Data Management

SEA's DASD/Data Management tools have become corporate standards, used in one out of every five MVS data centers worldwide.

Providing solutions for high-speed storage management, PDS dataset management, sequential dataset management, and VSAM control and optimization, SEA has set a new standard for efficiency and high performance in DASD and data management software.

SUPPORT AND DEVELOPMENT

SEA's Technical Support Department is divided into two levels. First-level support fields all initial contacts. While over 85% of all contacts are resolved on the initial call, if first-level support is unable to provide a solution, the call is transferred to second-level support. All second-level support personnel are members of Product Development Teams. While most calls are solved at the first-level, involvement with technical support keeps SEA developers in greater touch with our users. This procedure enables our developers to respond more effectively to the needs of the user community.

SEA's approach to development is to keep Product Development Teams together, working on specific products for the long term. We have found that this approach generates a high level of dedication and expertise. We believe that this methodology is the reason SEA has received such consistently high ratings from our users, for technical support and product development.

COMPANY ORGANIZATION

SEA is a privately held company, whose growth over the years has been internally funded by product sales. Our users have indicated that they prefer us to remain independent. This independence guarantees our ability to continue to provide the highest standard of product support and development currently available.

Software Engineering of America is proud to supply the mainframe user community with the above information about our company. We would also like to take the opportunity to express our appreciation for the support that we receive from over 6000 users worldwide. In return, we shall continue to deliver to our users, the highest level of dedication and support available in the industry.

If you are currently not an SEA user, we invite you to take a free, no-obligation trial of our products. We are certain you will find, as thousands of others have, that our products will provide cost-effective solutions to your installation's needs.

Thank you,
Software Engineering of America, Inc.

SEA

International Offices
NeübruckestraBe 30 • 4400 Münster • West Germany • Tel. (0251) 54447 • 42569
88A Searle Street • Cambridge / Cambs. CB4 3DD • England • Telephone: (0223) 312147 / 350910

DB2 information-sharing group formed

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — A nationwide DB2 users group was incorporated here late last month in an effort to share information about IBM's relational database management system that is being gathered separately by more than 25 DB2 users groups throughout North America.

Called the International DB2 Users Group (IDUG), the group's first aim is to hold a conference here in August. The group is overseen by the Chicago firm of Smith, Bucklin & Associates, which already organizes the Guide International Corp. and Share IBM users group meetings. But organizers say IDUG will not supersede existing DB2 users groups — or even DB2 user committees within Guide and Share.

"We're not going to try to submit DB2 requirements to IBM like Share and Guide do," said IDUG President Bill Backs, who is also director of information technology at Scott, Foresman & Co. here. "They're very good at submitting DB2 product requirements, and we don't want to dilute that role."

Instead, IDUG intends to give DB2 users and software vendors a single organization through which they can share DB2-specific information. "We're trying to form an organization that encompasses all the people connected with DB2," Backs said. "We are by no means trying to preempt the regional groups — but we would like to facilitate communications between them."

DB2 users groups have sprung up independently in all parts of the country since IBM introduced DB2 in 1985. The largest of these groups meet in New York, Chicago, Los Angeles, San Francisco, St. Louis and Toronto, and most draw 150 to 300 attendees per meeting.

All are welcome

IDUG will be managed by and for users, but vendors of DB2-related products and utilities are invited to join. "We want to acknowledge that vendors have a place in the user community," Backs said. "However, we're establishing a separate membership category for vendor members and limiting vendors to two of eight seats on the IDUG board of directors."

Two Chicago-area DB2 vendors, Platinum Technologies and Peat Marwick Advanced Technology, gave IDUG approximately $30,000 in start-up funds, Backs acknowledged. But software vendors, as well as users of IBM-compatible mainframes, have traditionally been unable to attend Guide and Share meetings, Backs said, because neither group could claim to own an IBM mainframe.

Leaders of regional DB2 groups seemed surprised by the creation of IDUG but are interested in learning more about it. "I'm taking a wait-and-see attitude," said Joyce Bischoff, chairman of the Delaware Valley DB2 Users Group in Philadelphia. "I'm in favor of good communications at any time, but up to now I've thought that Guide and Share were the ideal places to exchange DB2-specific knowledge."

Others were optimistic. "If IDUG gets off the ground, it'll be of great benefit to the user community," said Bruce Gallagher, president of the Greater New York DB2 Users Group. "And if IBM sees that IDUG represents its DB2 customer base, there is even the possibility for leverage with IBM."

The next few months should determine whether the concept of pulling together a single DB2 forum in the U.S. and Canada will work. IDUG plans to complete its mailing to 10,000 DB2 users this month. Fees from the summer conference would, in part, keep IDUG rolling into 1990.

SCIENCE/SCOPE®

A spacecraft that was sent to explore the planet Venus for eight months completed its first decade of space service. The Hughes Aircraft Company-built Pioneer Venus Orbiter was originally slated to circle the planet for one complete Venus rotation, approximately 243 Earth days, and provide the first topographic maps of the planet. However, its unexpected longevity has given scientists detailed information not only about Venus but also about comets that have streaked within sight of the probe. Despite its 10 years, the orbiter shows little sign of wear and is expected to operate for another four years until its fuel runs out.

Revolutionary computer architectures have the potential to achieve massive parallel processing capabilities beyond that of the fastest conventional supercomputers. Under development by Hughes for the U.S. Army Strategic Defense Command, these new architectures are designed to mimic the brain's vastly complex neurobiological structure. Using this technology, a new generation of computers may provide the solution for real-time processing problems like automatic target recognition, weapons allocation, automatic speaker identification and multi-sensor data fusion.

A new superprojector provides large-screen display of computer data in full color. Designated Model 1000, the projector is designed for applications where real-time computer information must be viewed by large numbers of people. High-intensity xenon arc lamps, combined with the Hughes-developed liquid crystal light valve, generate a display with resolution in excess of 1,000 TV lines. Data is seen crisply and clearly, through front or rear projection, in normal room light. The superprojector is compatible with virtually all currently available computer sources and is derived from sophisticated color projection systems developed by Hughes for military command and control centers.

A seven percent increase in the production of oil from the giant Norwegian Oseberg field is the goal behind Norsk Hydro's Troll-Oseberg Gas Injection (TOGI) Project. Engineers will inject gas from the huge Troll Field into Oseberg to help maintain pressure in the reservoir as oil is taken out. At its center, TOGI has a five-well subsea template/manifold system, 305 meters deep, linked by pipeline and electro-hydraulic umbilical to the Oseberg "A" platform over 30 miles away, nearly three times the distance of existing subsea controls. The electro-hydraulic control system uses sophisticated surface and subsea electronics developed by Hughes. The system integrator is Vetco Gray Inc.

Engineers and scientists are eligible for approximately 100 Hughes Fellowships awarded for the pursuit of Master's and doctoral studies in Engineering and Science. All Fellows work full-time at Hughes during the summer, with Work-Study Fellows working part-time during the academic year and Full-Study Fellows attending classes full-time. Fellows receive full academic expenses plus stipends for studies at approved universities. Additionally, Hughes offers a two-year, entry-level rotation program that enables qualified BS and MS graduates to diversify their engineering experience. For more information contact the Hughes Corporate Fellowship Office, Dept. S3, C1/B168, P.O. Box 45066, Los Angeles, CA 90045-0066. U.S. citizenship may be required. Equal Opportunity Employer.

For more information write to: P.O. Box 45068, Los Angeles, CA 90045-0068

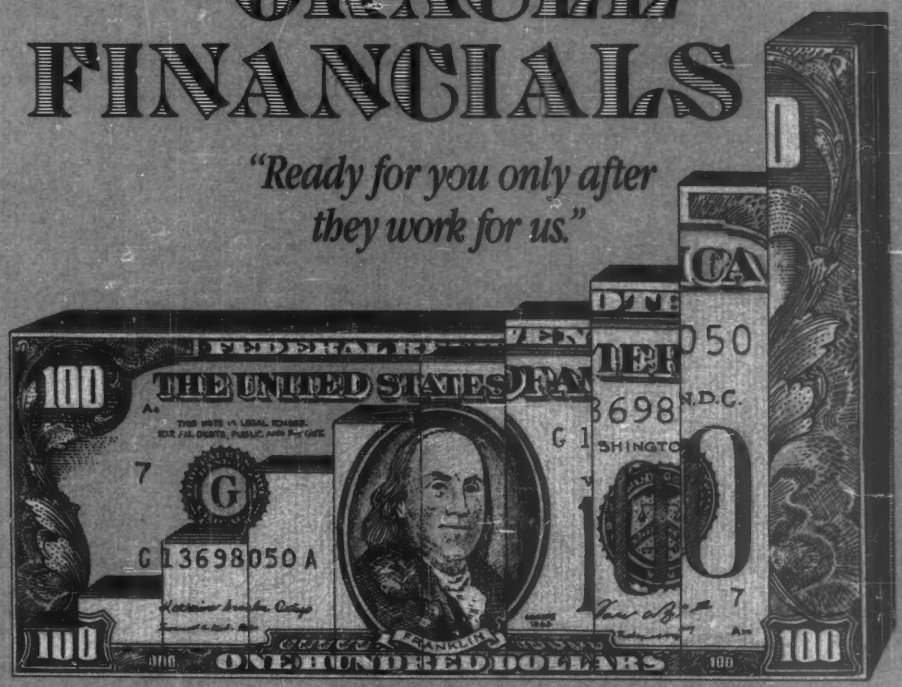
HUGHES

© 1989 Hughes Aircraft Company

Subsidiary of GM Hughes Electronics

Announcing ORACLE FINANCIALS

"Ready for you only after they work for us."



Oracle Financials

Oracle General Ledger,™ Oracle Payables,™ Oracle Purchasing™ and Oracle Assets™ applications have world-class functionality, yet are so easy to use that you may not bother to read documentation. Not only can they do anything you need to do, but they do it effortlessly and on the computer of your choice — mainframe, minicomputer or workstation — at the location of your choice.

"...Oracle Financials seem too good to be true. They offer full-featured accounting capabilities... without having to write any applications."
— Howard Ember, Treasurer, Tootsie Rolls

The best software quality control in the world

"By being the very first production user, Oracle demonstrated their absolute confidence in the financial software they intended to sell. This quality control alone makes Oracle Financials worth a close look."
— David Thomas, Hambrecht & Quist

In three years, Oracle's sales grew from $25 million to almost $300 million. They went from 1000 customers to over 10,000, from 2 products to over 100, from $15 million in total assets to over $250 million with several major corporate reorganizations along the way. Oracle Financials were there every step of the way.

"Oracle Payables is one of the few packages we evaluated that can really deal with the demands of a very large company. And by being able to implement Oracle Financials on our existing minicomputers, we saved $500,000 over the cost of other alternatives."
— Michael Prince, Data Processing Manager, Burlington Coat

"The flexibility of Oracle Financials lets us focus on our company's growth, not our accounting systems. Whatever your industry, whatever the size of your company, we are certain that these products will work for you. ***We invite you to attend the next Oracle Financials briefing and demonstration in your area."***
— Jeffrey L. Walker, Senior VP, CFO Oracle Corporation

Copyright © 1988 by Oracle Corp. Oracle Financials, Oracle General Ledger, Oracle Payables, Oracle Purchasing and Oracle Assets are trademarks of Oracle. TRBA

ORACLE®

Call 1-800-345-DBMS, ext. 8110 today.

20 Davis Dr ive, Belmont, CA 94002 • World Headquarters (415) 598-8000 • Calgary (403) 265-3622 • Ottawa (613) 236-2361 • Quebec (514) 337-0735 • Toronto (416) 598-7750 • ORACLE Systems Australia 61-2-959-5080 • ORACLE Europe 44-1-946-8911 • ORACLE Systems Hong Kong 852-5-268846

Oracle Financials Seminars

AK	Anchorage	Feb 6
AZ	Phoenix	Feb 7
	Scottsdale	Apr 11
CA	Costa Mesa	Jan 24 Apr 25 Jun 22
	Los Angeles	Jan 19 Mar 14 Apr 20
	Ontario	Mar 21
	Sacramento	Mar 21
	San Diego	Jan 17 Mar 16
	San Francisco	Jan 24 Mar 29 May 18
	Santa Clara	Jan 12 Mar 9
	Universal City	Apr 6
CO	Englewood	Jan 31 Mar 7 Jun 6
CT	Farmington	Mar 7
	Stamford	Mar 21 Jun 8
FL	Boca Raton	Feb 7
	Jacksonville	Jan 19
	Miami	Jan 17
	Tampa	Mar 22
GA	Atlanta	Jan 17
	Savannah	Apr 27
HI	Honolulu	Mar 14
IA	Des Moines	Jan 17
ID	Boise	Apr 13
IL	Chicago	Jan 25 Feb 28 Mar 21 Apr 18 Jun 14
IN	Indianapolis	Jan 31 Mar 22 Jun 7
KY	Louisville	Apr 4
LA	New Orleans	Jan 27
MA	Boston	Jan 17 Apr 20 Jun 6
	Burlington	Mar 15
MD	Baltimore	Apr 12
	Columbia	Mar 15
ME	Portland	Mar 2
MI	Dearborn	Feb 7 Apr 4
	Grand Rapids	Jan 12 Mar 8 Jun 6
	Lansing	Feb 14
	Troy	Mar 7 Jun 7
MN	Minneapolis	Jan 11 Mar 14 Jun 13
MO	Kansas City	Jan 26 Jun 27
	St. Louis	Jan 12 Mar 9 Jun 6
NC	Raleigh	Jan 10
NE	Omaha	Apr 6
NJ	Iselin	Feb 15 Mar 30 Jun 28
	Princeton	Jan 18 Mar 15
	Secaucus	Jan 26 Mar 2 Apr 19
NM	Albuquerque	Mar 7 Jun 7
NY	Buffalo	Jun 6
	East Syracuse	Jun 15
	Fairport	Feb 9
	Melville	Jan 18 Mar 15
	New York City	Jan 25 Feb 22 Apr 19 Jun 14
OH	Akron	Feb 1
	Beachwood	Apr 5
	Cincinnati	Jan 26 Mar 23
	Columbus	Jan 12 Mar 9
OK	Oklahoma City	Feb 8
	Tulsa	Jan 24
OR	Portland	Mar 14
PA	Philadelphia	Feb 6 Apr 10 Jun 19
	Pittsburgh	Jan 18 Mar 15 Jun 14
	Scranton	Feb 15
RI	Providence	Feb 2
SC	Charleston	Mar 9
	Greenville	Feb 8 Apr 13
TN	Memphis	Apr 19
	Nashville	May 4
TX	Austin	Jan 19
	Dallas	Jan 10 Feb 1 Mar 7 Apr 4 May 4 Jun 7
	Houston	Jan 12 Feb 9 Mar 9 Apr 6 May 4 Jun 8
	San Antonio	Jan 20
UT	Salt Lake City	Feb 1
WA	Seattle	Jan 5 Feb 21 May 17
	Spokane	Apr 25
WI	Madison	Feb 22
	Milwaukee	Jan 26 Mar 8 Jun 6

Attn: National Seminar Coordinator
Oracle Corporation
20 Davis Drive
Belmont, California 94002
1-800-345-DBMS, ext. 8110

☐ My business card or letterhead is attached. Please enroll me in the *FREE* Oracle Financials seminar to be held

at: _____

on: _____

COMPUTERWORLD

INTERVIEW

A view from the top

With thinned management ranks, less hubris and the secret weapon — SAA — John Akers points IBM toward the 1990s, ever mindful of the mine fields that await the giant

When John F. Akers became chief executive officer of IBM in 1985, the world's most profitable corporation saw a bright future ahead. The 3090 was ushering in a lucrative mainframe product cycle, the IBM Personal Computer was king of the desk top, and IBM had ambitious plans to battle AT&T for worldwide communications supremacy. Most ambitious of all, IBM said the heady goal of $100 billion in annual revenue was attainable by 1990.

Within one year, however, Akers faced a much more humbling challenge — how to restore year-to-year growth in profits. After IBM's first two consecutive years of earnings declines since the Great Depression, Akers achieved that goal in 1987 and will again in 1988 — although profits will still be below their 1984 peak.

Akers implemented some of the most sweeping internal changes in IBM's history, including a net work-force reduction, without layoffs, of about 16,000 employees since 1985.

In an exclusive interview with Senior Editor Clinton Wilder and Editor in Chief Bill Laberis last month at IBM's Armonk, N.Y., corporate headquarters, Akers spoke candidly about IBM's overdue reorganization, his feelings about Japan's MIS philosophy and IBM's software and telecommunications strategies to serve distributed IS organizations.

ANDY FREEBERG

"WE'RE A more humble IBM, with more of a desire to participate with our customers, have them come into our facilities, review our plans and programs."

The cost cuts and redeployments of the past three years were necessitated by what would appear to be a bloated middle management structure. How did things get to that point, and what lessons has IBM learned?

For 75 years — certainly for the past 25 — IBM has had a remarkable performance in business success. That success tends to have a management team not want to tamper with what's in place. As that success began to diminish a bit in the last three or four years, it's an awful lot easier to gain the attention of the management team and all the people.

What had to happen for this enterprise is to have reality come in and hit us on the head. Reality has hit us on the head, and we say, "What does it take to be competitive, to get growth going again, to have the return on investment that we want to have?" But it takes that cold shower before you come to work in the morning to get your blood going. And our blood is going.

In comparing the MIS market with what it was 10 to 15 years ago, is it fair to say customer loyalty isn't what it once was?

Well, there are an awful lot more customers. When I grew up as a salesman with IBM in the '60s, we used to have one or two customers per enterprise. Today, there are thousands. There's a much broader constituency to try to satisfy, and there's a much broader array of competitors trying to do exactly the same thing. The race is getting swifter.

At *Computerworld*, we see a less hierarchical distribution of power in information systems networks. How do you look at the MIS chief as this evolution is taking place? How is IBM relating to that individual or office?

Well, I think that job is getting a whole lot harder. There are three or four pressures on that individual that are very tough.

The top management of American industry is constantly asking whether or not they're getting their return on their investment in information systems. That office has to help answer that question, and we have to help as well.

Secondly, because more people are involved in the enterprise, the job becomes not deciding what to do and doing it — but deciding what to do and then trying to get everybody into that same boat. There's a lot of persuasion that has to go on, and that's very tough.

The third major pressure, particularly in enlightened business enterprises, is that competition, for our customers, is as tough as it is for us. Information systems, appropriately applied and implemented, can be a competitive weapon.

The role the IS manager should be playing is more central to the operations of the business.

Absolutely. It wasn't so long ago that you had to be technically competent and deliver what you promised. Those days are gone. You have to be an advocate for and implementer of systems across enterprises that really impact the competitiveness of the enterprise. That's a big job.

What challenge does that pose to IBM to serve that IS manager? How does IBM respond?

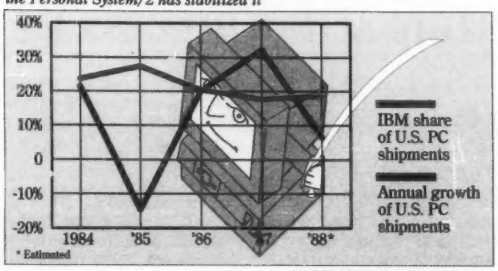
In two major ways. First of all, we have created a sales and support organization around the world that increasingly understands our customers' businesses and business problems. We'd like to have the IBM team viewed as a plus in the discussion of the business problems. Technical competence, in and of itself, won't carry the day at all.

The second thing is, we're spending more of our development money on solutions. There are a lot of questions about IBM being a hardware business or a mainframe business, but you'll find an increasing percentage of development resources going into solutions. The operation in the U.S., leading it on a worldwide basis under Ned Lautenbach, has very aggressive budget increases.

What do you mean specifically by more development effort into solutions? Is it more vertically oriented applications? Is it mainframe-oriented?

Challenge of the clones

IBM's personal computer market share dropped 10 points by 1987, but the Personal System/2 has stabilized it



SOURCE: INTERNATIONAL DATA CORP.

It means that if you were to walk into Ned Lautenbach's conference room, you would find him conducting meetings on what are the top opportunities for information systems, industry by industry. What are the ingredients necessary to provide that set of solutions to the marketplace? Some of them will be 370, some will be AS/400, some will be PS/2, and some will be all of the above. When SAA gets fleshed out a bit more, it will go across all three.

When you make significant internal changes, as you have done, that can be painful. Do you feel that the company is over the worst of the adjustments that it needs to make internally?

The vast majority of organizational and management changes are in place. You don't organizationally change a business as large as this one, as much as we have, without creating some disruption. There's been a feeling on the part of IBM people that we're on the right track — and then schizophrenia about more change vs. "let us absorb what's already in place."

Were there fundamental shifts in demand or market conditions that caused IBM to reassess its approach?

I don't think they were fundamental changes, other than the continuing changes toward easier-to-use, lower priced computers and a plethora of workstations and networking. But I think all of us in the industry understood that that was going on.

What IBM needed to do better was to be closer and more in concert with our customers. We needed to have a better product line, and we needed to be more efficient.

I meet with customers very often, all around the world, and all of them say there is a new and different IBM. That doesn't mean it's a perfect IBM; it's a new and different and improving IBM, and that's gratifying. We're a more humble IBM, with more of a desire to participate with our customers, have them come into our facilities, review our plans and programs.

You have spoken out strongly in the past about IBM's need to protect its intellectual property. How do you feel, on a gut level, about the recent arbitration decision granting Fujitsu restricted access to IBM source code? Are you comfortable with it?

I'm comfortable with the conclusion.

What do you think is the proper role for the U.S. government in trade? What would you like to see more of from the incoming administration?

The actions that have been taken by the Reagan administration have been terrific. I would say it should be a continuation of the same. In the final analysis, what the world needs is open markets and open trade.

What are two or three technologies that you think will have the most impact on your largest customers, and *Computerworld* readers, in the next five to 10 years?

I would say Systems Application Architecture is one. I'm not being facetious. If you ask the pros in computing what they'd like to do that they can't do today, what they need is productivity enhancements in software development, continuity in terms of people dealing with computers and screens, and enhanced connectivity. That is precisely what we're trying to give them.

Doing more with less

Akers' work force reductions have paid off in increased efficiency during the last two years

SOURCE: IBM
CW CHART

Beyond that, I would expect that some of things going in image processing [will have a large impact]. I went down to USAA Insurance in San Antonio to see what's going to happen there when they take the 25 million letters they get every year and eliminate all the paper; it's very exciting. And it's not just the people dealing with the paper that will be impacted, it's the management and executive management, who wax eloquent about the competitiveness of their enterprise.

Perhaps expert systems will have a bigger impact, too.

Does Wall Street adequately understand what it means to change a company as large as IBM in a rapidly changing industry?

I think there is a tremendous desire for short-term performance in U.S. markets. The short-term performance of IBM in 1987 and 1988 has been satisfactory. I think what Wall Street would like to see is a continuation of what the trends have been.

How do you deal with the conflict between Wall Street's desire for short-term results and a company's long-term plans, some of which may take years to bear fruit?

Every company in the U.S. has that conflict. We manage the business for the long haul. We're not simply a fab-and-assembly hardware business that picks technology off the shelf. We invest in our semiconductor facilities, and those paybacks aren't for five to seven years.

I think the software strategy that we're on, embodied by SAA, is long-term — you can't do those things in a very short time. If we didn't have that strategy, we'd be sitting around in task forces trying to figure out how to put that strategy into place.

It's in place now, and it's not all *manana* — you can touch and feel pieces of that software strategy that are in our customers' offices.

So we try to balance the need for tactical performance improvement, but practically speaking, this business has to be managed for the long term — and it is.

If you think back four or five years before you became CEO, what turned out to be different from what you expected?

It's been much more challenging than I would ever have thought. The requirements for IBM to change and the changes that are ongoing are probably as significant as any in the history of the enterprise. I think that in the early 1980s, for a time, the business enjoyed enhanced success over the prior five to eight years; that tended to suggest the business was in good shape and would continue to be so. And that clearly has not been the case.

So I think that the cold light of day is upon us; we understand what we have to do, and we're working hard at it.

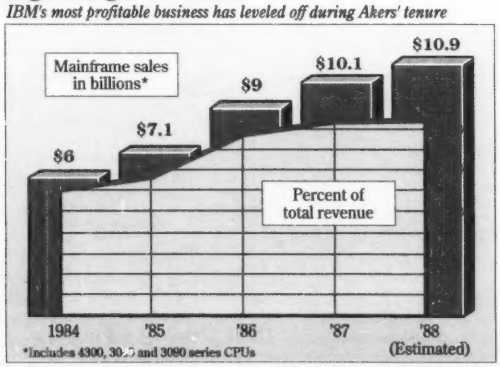
If you could put IBM's 500 largest customers in one room, what would you want to tell them about the IBM of the 1990s?

I would like to tell them that we really are working every day to try to have a set of delighted customers. The IBM of yesterday, which was a bit too reserved, played its cards too close to the vest, wasn't as approachable as people would have liked, is really an IBM of yesterday.

I would like to have an IBM emerge over the next several years that is sincerely approachable, that is responsive, that is open, that has a sense of humor, that doesn't take itself as seriously as perhaps it did in the past, that really is an enterprise dedicated to add value to a customer's operation. That's what I'd like to tell them: Keep watching this space.

High-end growth stalled

IBM's most profitable business has leveled off during Akers' tenure



SOURCE: DREXEL BURNHAM LAMBERT, INC.
CW CHART

Akers on Japan

The Japanese competitive edge usually evokes images of mass-produced CD players or memory chips. But to IBM Chairman John Akers, the edge also exists in the strategic use of computer technology.

"There's no question in the minds of Japanese management about the necessity to have effective, efficient, aggressive IS strategies," Akers said. "There is less commitment in the U.S., and I think that's a problem.

"That's another pressure on the IS manager, because there's an educational requirement that's necessitated by that lack of commitment," Akers added. "Non-American managements are more tuned up on this subject."

The telecom front

To most observers, IBM's telecommunications strategy for the past four years has been marked by fits and starts, with various investments in telecom providers being sold off or scaled back. Not so, says John Akers.

He insisted that IBM's former 16% stake in MCI Communications Corp. was primarily a financial investment and that its recent sale of 50% of Rolm Corp. to Siemens AG does not signify less emphasis on the U.S. private branch exchange market.

"We continue to want to aggressively sell PBXs in the U.S., and I think we can," he said. "Siemens brings relationships and a customer base in Europe, communications strengths that we don't have. We're putting this business together to use their strengths and ours; we're in it for the long term with them."

No managers

FROM PAGE 1

a project" or share an idea with the group, Jones said. Cooperation of all employees is needed for success, said Mike Bussey, a coach facilitator for the premiere self-managed group. "Some people say, 'All I want to do is my job; I don't want to manage myself or anybody else.' Others are gung ho about it; they think this is an opportunity to change the system."

Chuck Gibson, senior vice-president at Cambridge, Mass.-based consulting firm Index Group, Inc., said participants must be willing to put in the kinds of hours managers might more typically work. "There is a lot of emotional involvement and peer pressure in getting things done," he said.

Dual roles

To the upper echelon McDonnell Douglas managers, Bussey and his co-worker Betty Houchins are first-line managers of the 25-member Master Savings System (MSS) area. However, within the MSS, they are now considered members holding a coach facilitator role. The MSS maintains the corporate savings system activities, such as profit sharing. The group's mandate is to study its own functional area to find where and how it can be improved.

"The whole team is going to receive recognition for the work it achieves — not just me, not just Betty, but the whole team," Bussey said.

The facilitators estimated that the group has spent close to a man-year in hours on the project since August. "If you approach this with the idea of gaining immediate results, you're going to cause yourself frustration," Houchins said, adding that it could take up to two years to fully implement the plan as she envisions it.

Bussey said he thought the MSS area was a logical department in which to kick off the program because its employees had always worked as a team; he soon realized that his sense of team spirit was a bit naive. "There was always this silo effect of 'We're in charge and we'll let you know what has to be done,' " Bussey said.

The team spirit has been improving with time, however, Bussey said. A recent request by the auditing department, he said, is proof; six people volunteered to do the work. "Natural leaders emerge who will volunteer to do all of the coordinating. The team solidifies by itself," he said. In some cases, a group decision will not be as quick as a manager's, Bussey added, "but it may be a better decision."

The work groups planned for McDonnell Douglas are based in part on theories found in The Tom Peters Group's "Leadership Alliance" videotape program as well as the Japanese theory of Kaizan (which means continuous improvement). But theories alone do not make the idea work; what does make them work is support from supervisory personnel who must be willing to give up certain levels of responsibility and authority to the group, Jones said. While he added that he has heard no resistance to the plan, Jones said he suspects the transition to the work groups will be easier for younger managers than those who are solidly set in their ways.

McDonnell Douglas' Jones

At first, many of the participants in the work group had trouble adjusting to making their own decisions, Bussey said. "I have to turn to them and say, 'Whose responsibility is it to make the decision?' It is up to me as coach facilitator to try to get people to know that it is not always up to me to make the decisions in the self-managed team," he said.

Team spirit

Once the group had agreed to try the management concept, it started to meet as a team. "The first three meetings were extremely rough," Bussey said. "We first had to define what is a team and what is self-management." The group enlisted the help of a human-relations facilitator who was familiar with the self-managed-team process. Next, the group drafted a list of 21 issues it thought needed to be addressed within the MSS and the total IS organization.

Topics being addressed now include improving work flow, project management, group structure and procedures. One task the project management team studied was status reporting; it discovered this area cost the MSS department $192,000 annually. "We figured that that was a little too much. They're going to look into that further," Bussey said.

Still, Bussey said, the team has set some lofty goals, and things are moving at a slower pace than anticipated. There were many lessons to be learned, including teaching management techniques such as how to hold a proper meeting and how to handle disruptive behavior and conflict management, Bussey said.

So far, Houchins said, the concept has received acceptance from those involved. "I've talked to people and get the impression from everyone that if management decides they don't want to pursue it further, we'll decide how to continue it within our own [MSS] boundaries; they won't want to give up the ability to manage themselves."

Taken to its ultimate, the self-managed work group concept calls for the self-managed groups to also select their own leaders, something that is not likely to take place at McDonnell Douglas any time soon, Jones said.

Oracle 6.0 ships with transaction processing

BY AMY CORTESE
CW STAFF

Oracle Corp. recently shipped the first production copies of its Oracle Version 6.0 with a transaction processing option, although an unbundled release without the option will not be available until midyear.

While the unbundled version will be a free upgrade for maintenance customers, the transaction processing option bears a hefty charge — up to the full price of the database management system for the largest systems.

Some users said they believe the cost is justified by the performance improvements, but others are not so happy with the extra charge. Jim Hintza, vice-president of information systems operation support at Prudential-Bache Securities, Inc., said he would not buy the transaction processing option "for philosophical reasons," including maintenance charges that he claimed are "already incredibly expensive."

Unbundling bundles

It has been unclear what enhancements would actually be included in Version 6.0 without the transaction processing option, because the product has recently been unbundled.

But Peter Tierney, senior vice-president of Oracle's products division, said the upgrade would not include row-level locking or PL/SQL, Oracle's proprietary SQL-based development language.

Down the road

PL/SQL is still in the testing stage and is not included in the first release of the transaction processing option; it will be offered early this year, according to Oracle. PL/SQL code can be inserted into old applications to gain performance increases. However, according to the company, the main benefit of PL/SQL will be in developing new applications. David Hart, executive director of university computing and planning at the University of Houston, said PL/SQL will facilitate applications writing.

The transaction processing option is intended for update-intensive and many-user applications, according to Oracle. Tierney said he expects one third of Oracle's present customers to move to transaction processing during the next year.

Version 6.0 with the transaction processing option is now generally available for most hardware platforms, including Digital Equipment Corp. and Sun Microsystems, Inc. hardware, with an IBM mainframe version and DEC Vaxcluster support expected to be available in April or May.

Before you expand, see who's

You'll find it's MICOM. With over half a million installations, we connect more data network users than anybody.

Everything you'll need to connect your new system, we can supply: Local multiplexors. Local T1 multiplexors. Data over voice. Terminal-powered line drivers. Local data sets. Sync and async leased-line modems. The broadest product line of its kind anywhere. All so reliable you can hook them up and forget them.

And all designed to let you take max-

Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only $39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48

* U.S. Only. Canada $110, Central/South America $135, Europe $195 (Airmail), all other countries $295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government — State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other _____
   - 95. Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   - **IS/MIS/DP MANAGEMENT**
   - 19. Vice President, Asst. VP
   - 21. Dir., Mgr., Supvr., IS/MIS/DP Services
   - 22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
   - 23. Dir., Mgr., Supvr., Analyst, of Systems
   - 31. Dir., Mgr., Supvr., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Supvr., OA/WP
   - 38. Data Comm. Network/Systems Mgt.
   - **OTHER COMPANY MANAGEMENT**
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President/Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales/Mktg. Mgt.
   - **OTHER PROFESSIONALS**
   - 60. Consulting Mgt.
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educators, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermnis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

E4902-9

Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only $39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48

* U.S. Only. Canada $110, Central/South America $135, Europe $195 (Airmail), all other countries $295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government — State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other _____
   - 95. Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   - **IS/MIS/DP MANAGEMENT**
   - 19. Vice President, Asst. VP
   - 21. Dir., Mgr., Supvr., IS/MIS/DP Services
   - 22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
   - 23. Dir., Mgr., Supvr., Analyst, of Systems
   - 31. Dir., Mgr., Supvr., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Supvr., OA/WP
   - 38. Data Comm. Network/Systems Mgt.
   - **OTHER COMPANY MANAGEMENT**
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President/Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales/Mktg. Mgt.
   - **OTHER PROFESSIONALS**
   - 60. Consulting Mgt.
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educators, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermnis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

E4902-9

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

AT&T puts Unix at arm's length

BY AMY CORTESE
CW STAFF

AT&T last week took steps to distance its controversial Unix software business from its hardware strategies with the official launch of a new software division, dubbed the Unix Software Operation.

Lawrence Dooling, formerly vice-president of marketing and sales support at AT&T's Data Systems Group, was named president of the new business unit and will report to Robert Kavner, president of the Data Systems Group.

The new business unit will consolidate Unix operations, including Pacific and European Unix divisions, and will be responsible for the development, marketing and licensing of Unix System V software.

In an interview last week, Dooling said his responsibilities will be to maximize the growth of Unix software and revenue generated from it. He said his priority is to be responsive to customers — Unix International and others — and to address some of the criticisms for which AT&T has come under fire.

Kavner first talked about spinning off AT&T's software operations last May, only weeks after taking the reigns of the Data Systems Group. As a supplier of both hardware and operating software that was licensed to other computer manufacturers, AT&T was heavily criticized for its handling and licensing of the Unix operating system.

Has to be different

Dooling said that for Unix System V to take off as a widely used operating system, "Unix licensees have to be assured that it is a separate product available to meet a separate need, distinct from the Data Systems Group."

Unix International, the advisory group of Unix System V licensees, was recently formed to provide input to AT&T on the development and licensing of System V. Dooling said AT&T has been meeting continuously with the group and has started the formal process.

The separate software unit is also likely to minimize protests

AT&T's Dooling

and appeals against AT&T government contract awards, since the Unix software and support will be identically available to all licensees, Dooling said.

The Unix Software Operation will include responsibility for System V's graphical user interface, Open Look. The product, jointly developed by AT&T and Sun Microsystems, Inc., was submitted for consideration as the interface for the Open Software Foundation (OSF). However, the OSF's recently announced selection included not Open Look but the Hewlett-Packard Co./Microsoft Corp. Common X Interface combined with Digital Equipment Corp.'s Decwindows.

Dooling said AT&T had made a professional submission in terms of technical, business and legal aspects but that he was not surprised it was not chosen. He also said that AT&T will continue to market Open Look, due this quarter, but would attempt to provide some compatibility with the OSF interface.

However, if a standards body such as X/Open Consortium Ltd. or Posix were to specify an interface as a policy, AT&T would support it along with Open Look, he said.

SEC awards $52M electronic filing contract

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Securities and Exchange Commission (SEC) awarded a $52 million contract last week for the EDGAR electronic filing system, ushering in an era in which firms will send financial reports to the SEC in electronic rather than paper formats.

EDGAR, which stands for electronic data gathering, analysis and retrieval, is expected to replace the more than one million pieces of paper the SEC gets from public companies each year.

The SEC awarded its high-profile contract to BDM Corp., a McLean, Va.-based systems integrator, bidding with subcontractors Mead Data Central, Inc., Sorg, Inc. and Bechtel Information Systems.

Many agencies are jumping on the electronic filing bandwagon, allowing companies to submit government-mandated reports, tariffs and taxes via magnetic media or data communications [CW, Sept. 5]. A 1988 government survey showed that 68 federal agencies have an operational electronic filing system, and seven more have pilot programs under way.

In essence, EDGAR has three subsystems:

- Data collection. EDGAR will enable companies (or their financial printers) to make required filings via direct transmission, disk or magnetic tape. Filers will begin using the system in several phases from mid-1990 to 1993, when all filers will be required to use EDGAR.
- Data analysis. EDGAR will help SEC staff members to retrieve and analyze financial reports at workstations. Retrieval software will be developed by Mead Data Central, known for its Lexis and Nexis on-line databases.
- Dissemination. EDGAR data can be viewed by the public and press at terminals located at SEC offices. In addition, Mead Data Central will sell bulk subscriptions to information vendors — either via a real-time feed of EDGAR data or an overnight magnetic tape.

THE CONTRACT AWARD was a coup for Mead Data Central, which will distribute Securities and Exchange Commission information to the public and information resellers under government-regulated pricing terms.

The SEC said its pilot EDGAR system, built by Arthur Andersen & Co. in 1984, has been successful and collected more than 45,000 electronic filings from 525 volunteer companies.

Along the way, however, the pilot system generated a lot of controversy and raised a host of new policy questions. Congress criticized the contract management; information brokers worried about unfair government competition; and bidders balked at the SEC's original financing plan [CW, March 25, 1985].

The contract award was a coup for Mead Data Central, which will distribute SEC information to the public and information resellers under government-regulated pricing terms. In addition, Mead Data Central said it will become one of the first customers of the regulated dissemination service so it can offer a commercial database of SEC filings to investment bankers, lawyers and financial services companies.

In a statement released by Mead Data Central, Jack W. Simpson, president of the Dayton, Ohio-based company, called the SEC contract "a model for the partnership between government agencies and commercial enterprises that will hasten the era of electronic information in the professional sector."

#1 in local data networks.

imum advantage of the wiring that's already in your walls. Because they work on twisted-pair copper. Eliminating the need for costly coaxial cables or fiber optics.

So MICOM will make your new network more cost effective. More flexible. More reliable.
That's why we're #1.

MICOM
1-800-MICOM U.S.

EDITORIAL

Reality check

THE COLD LIGHT of day is upon us.

That is the way IBM Chairman and Chief Executive Officer John Akers summed up the reality check he and his lieutenants have undergone during the arduous and sometimes painful process of attempting to change some of the most fundamental business practices of the giant company.

In a wide-ranging interview with *Computerworld* (see story page 14), Akers makes it clear that the world to which IBM must respond and act within is far different from the world of just a few short years ago. Competition is measurably more fierce. Customers are decidedly more sophisticated and, therefore, much more demanding. Ultimately, the essence of success is not only keeping up with change but also anticipating it and recasting business strategies to exploit change.

But if you read carefully, you will find that this is not a gauntlet that only IBM must run: It is almost precisely the same treacherous terrain that information systems organizations are coursing right now as we head toward the 1990s.

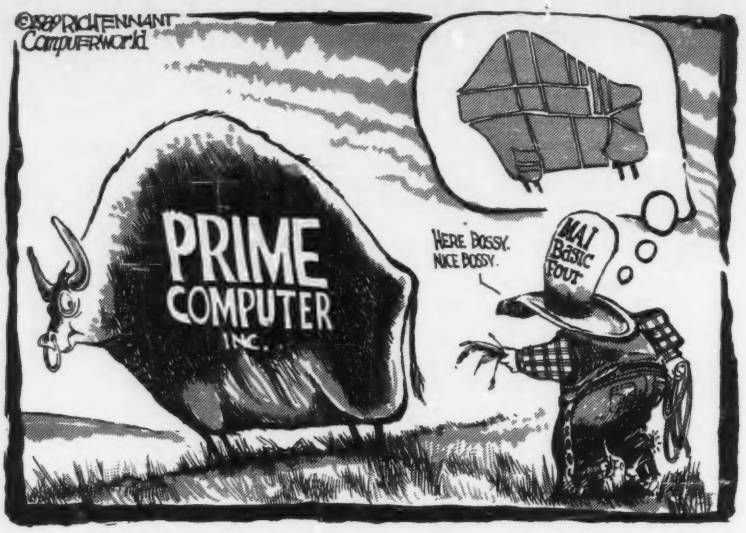
Akers specifically addresses and enumerates these challenges to IS, making the parallels between the IS challenge and the IBM challenge all the clearer. For starters, senior management in U.S. corporations is increasingly demanding accountability from IS. Remember the days when few even dared ask what was up in DP/MIS for fear of getting an answer they wouldn't understand anyway?

Then there is tremendous pressure from the swelling ranks of end users and others involved in the IS planning and implementation process — people who today have to be persuaded, coddled and indulged like a real customer. Whatever happened to the old, impenetrable data processing bureaucracy?

Finally, there is the IS manifest destiny that computer-based systems and networks hold the key to competitive advantage, forming an undeniable link between the performance of the enterprise and the fate of IS management. Wasn't it just yesterday that getting the payroll out on time and pumping out reports was considered a good week's work?

If there is a single word that spells the difference between the information environment of yesterday and that of today and tomorrow, it is *complexity* — both for the bellwether vendor and for IS organizations. Decisions made locally (at the business unit level at IBM, within the discrete IS department at other U.S. companies) today hold ramifications downstream throughout the entire organization. There are more mouths to feed, more hands to hold. Bullying is replaced by persuasion; audacity with tact.

But perhaps most of all, IBM and the IS community have learned the bitter lesson espoused by a magazine editor in the 1950s: Nothing recedes like success.



LETTERS TO THE EDITOR

A little care

Regarding the recent articles about the Internet virus attack, one point that was not mentioned is that the fix to the Sendmail feature that allowed the initial assault was posted to Internet systems administrators more than two years ago.

The fix to this particular problem has been well known for years in the Internet community. I might point out that this security hole has nothing to do with the inherent security or lack of security of the Unix operating system. With careful system administration, Unix can be made as secure as the proprietary systems of other vendors.

Smoot Carl-Mitchell
Managing Partner
Texas Internet Consulting
Austin, Texas

A few small things

We at Via Information Systems Corp. congratulate *Computerworld* and Bob Moran on your article covering the release of Version 1.2 of our distributed database server, Via/DRE [CW, Nov. 14]. The article was both well-thought-out and well-articulated.

We do wish, however, to point out one or two errors that, while small, could create major misunderstandings. First is the fact that for the 14 months it has been shipping, Via/DRE has had an implicit transaction control that automatically rolls back any single transaction that fails, for whatever reason. The feature that is being added is explicit transaction control that will roll back the entire transaction automatically if any single update fails. That feature is completing final beta testing and will be released within two to three weeks.

Most importantly, we appreciate your attention to the real newsworthiness of a product that provides PC/LAN truly distributed database management today.

P. E. Borkovitz
President
Via Information Systems Corp.
Princeton, N. J.

No surprise

After reading your two articles, "Users lament Lotus delay" and "Add-ons simplify 1-2-3" [CW, Oct. 10], I must say I'm not surprised that Lotus is two years late in coming out with its upgrade of 1-2-3. I believe that Lotus is two years behind because it has been trying to keep its market share by continually reassuring its customers that its product was near completion when it knew the whole time that completion was going to take longer.

Another problem that *Computerworld* pointed out in "Add-ons simplify 1-2-3" is the other add-ons, such as the two that Marq Technologies and Personics Corp. have created, that interface with the Lotus program. By beating Lotus to the punch, companies such as Marq and Personics make the Lotus upgrade even less attractive to consumers who can easily purchase the add-on software. Lotus has proven that it cannot make timely adjustments to the ever-changing software market. It has lost respect as well as consumer patronage and now find its program as well as its upgrade in jeopardy.

As a senior in the Business Management Information Systems Department at the University of Idaho, I feel that Lotus has indeed lost credibility. How about you?

Augustino R. Lucenti
Moscow, Idaho

The time is now

David Baer's article, "Cooperative processing" [CW, Nov. 14] raised many interesting points. However, his conclusion and bias that "... its time has not yet come" is incorrect.

Most major corporations do have underutilized, powerful desktop CPUs. More and more, those personal computers are connected to LANs, minis or mainframes. And more often than not, their larger processors are bursting at the seams or soon will be.

Offloading many of an application's resource-intensive tasks — such as user interface management and basic data validation — to the PC while providing transparent access to a remote, shared data source such as DB2 not only can happen today but is happening today.

Not all companies are ready for cooperative processing, and not all applications are appropriate for a cooperative solution, but many are. Moving ahead with cooperative technology is a very wise and cost-effective business decision.

Abby Pinard
Vice-President, Marketing
Must Software International
Norwalk, Conn.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Justifying your budget and your existence

JOHN KIRKLEY

Just what do you do when you're sitting around the conference table at budget time and one of the senior managers — the one who always taps his gold pen and pulls down the edges of his tight, thin mouth when he encounters a number over $500 — says, "I see MIS is looking for a 15% increase again this year. I'd like to know precisely what we're getting for our money."

The game is called justifying your existence, and it is even harder to play in these unsettled and perilous corporate times. At these sessions, being able to show a correlation between information systems dollars spent and an improvement in the company's fortunes is most desirable.

The game would not have to be played if MIS managers were cutting their budgets in 1989. However, budget trimming is not the trend, reports the Boston-based Index Group. The market research firm received responses from more than 10,000 senior MIS executives to a survey conducted in October. Nearly two-thirds of the respondents said they planned to increase their budgets by an average of 12.8% this year.

Out of 20 concerns rated in the survey, cutting costs ranked No. 14 in the minds of these MIS managers. Yet many were aware that their bosses might not be taking as sanguine a view of IS expenditures. The Index Group's executive summary reported, "While 79% of the IS executives disagreed that their organizations are spending too much on information systems, only 42% said their senior management would similarly disagree."

Those who said their senior managers believe too much is spent on IS almost unanimously stated that management does not understand the real benefits from systems. "They only see the expense side; there isn't enough communications of the value/benefits derived," said the IS chief of a chemicals company unit.

"Systems traditionally don't deliver the same kind of value that other departments do," chimed in the top IS professional at a consumer products company.

Now, put yourself in the place of that cost-conscious senior manager mentioned at the beginning of this piece. There you are, tapping your pen on your IS manager's budget printout, listening to him tell you that systems traditionally do not deliver value as normally measured in other parts of the company. "Just what . . ." you might ask in a low voice tinged with a slight edge of menace, " . . . just what do your systems deliver?"

Playing the field

Deciding to do a little field work of my own, I called up several IS managers and asked how they went about justifying their budget. All had gone through the process many times during their long tenure. At one company, which was still recovering from the aftershocks and debt precipitated by an unsuccessful, unfriendly takeover attempt, the IS manager said that the current lean times had actually made justification very simple.

"We only do things that are absolutely essential to support the company's mission," he said. As a major textile manufacturer, part of that mission is to remain competitive in a global marketplace — "to beat the offshore competition," as he put it. To accomplish this goal, the company has made a substantial IS investment in electronic data interchange (EDI).

"We're reducing the response time from the moment the consumer in the store requests a particular item to the delivery of the finished goods to the retailer," he continued. "These days, in the clothing market, it's not so much quality or cost that makes the difference; it's availability and conforming to trends. This means fast turnaround."

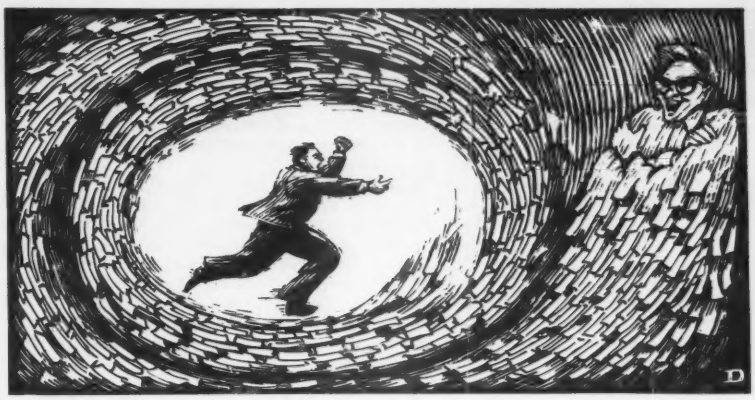
By using EDI, his company has formed a partnership with the other suppliers in the cycle, all the way from the producer of the fibers to the manufacturers of the finished goods and the retailers.

Even prior to the goods' leaving his company's shipping dock, an EDI message is sent to the destination detailing the materials being shipped — color, dye lot number and even the sequence that the bolts of material were packed on the truck. "We support strategic business objectives," the IS manager said. "We help to give our company that critical competitive edge."

Competitiveness was cited by several other managers. But, noted one IS professional at a large manufacturing concern, "justification these days has become a lot harder. It used to be

Continued on page 20

Kirkley is a computer industry writer, editor and consultant based in Warwick, N.Y.



BOB DAHM

When the virus catches you

HARVEY P. NEWQUIST III

You're safe. The virile virus of 1988 passed you by. You assured both your CFO and COO that your data department is safe. As you lean back in your chair, legs crossed and arms folded behind your head, you even intimate that maybe — just maybe — the whole virus thing is a little overexaggerated.

It is 3:30 a.m. You are sleeping soundly, dreaming of — a ringing phone shatters your sleep. Wondering who besides a prankster would be making calls two hours before dawn, you mumble hello into the phone.

It is your night shift supervisor, the man who oversees the input of transactions from the previous day.

He is nervous. He thinks you better come in real quick, like now. His voice raises a little in pitch and volume. The main computer system has slowed down to a crawl. There's no available memory for any more input. Routines that normally take 30 seconds are averaging 15 minutes.

All this has been going on since 2:00 a.m. He didn't think he should wait any longer to call. He has no idea what the problem is, but he senses it's going to get worse.

At 4:05 a.m., you're standing in the middle of the data center, and no one is working. The night crew can't run any more jobs because all available memory is filled with nonsense data.

Any attempt to get information out of the system just causes a whirring of disk drives for minutes before coming up blank. Blank! Your system is filled to the brim with data, but you can't seem to extract any of it, because something isn't letting it out.

In your optimistic mood — "It can't happen here!" — you determine that there must be something terribly wrong with the system access. Probably just an inocuous little glitch, maybe part of a damaged operating system.

At 5:30 a.m., you are sweating profusely, even though it is cold in here and colder outside. Your system has stopped. Immovable. Frozen. Dead. The computer claims that all disks and memory spaces are full but shows no data files.

Every single record of every single transaction of every single department in the company is stored in those files — accounting, payroll, personnel, sales, inventory and so on. What if those files are damaged? Most are regularly backed up, like accounting, but some . . . well, no use thinking about that yet.

All you can think of now is your little remark to the boss about viruses and exaggeration. This is a virus if you've ever seen one. But, of course, you've never seen one. How many people have?

Visions of data files . . .

At 6:30 a.m., with thoughts of data files vanishing into magnetic oblivion, you call your regular systems maintenance people at home and tell them to get to work, pronto. Your prized MIS department has sat idly for hours. The night shift crew hasn't done anything but stand around the perimeters of the room waiting to go back to work. Most of yesterday's transactions are still stacked up at terminals waiting to be input.

You now have your three most valued systems employees poring over terminals, scratching their heads and calling out strange commands to one another, all the while feverishly hammering on their keyboards.

In one hour, your regular crew gets in to work. You decide to send the night shift home. The night supervisor, looking like a shell-shocked junior lieutenant, says he'll stay to help wherever he can. And he wants to know what the hell happened and when.

It's 9 a.m. Now your day crew is standing idly around the perimeter of the room, waiting to work. The maintenance guys say they've isolated the core of the virus, but they're not sure what to do about it. They say it's pretty small, maybe only about 80K bytes in size, but that it's like a black hole — it has eaten all of the space around it.

What about the regular files? Is the data intact? They're not sure. One says yes, the other says no, the third is undecided. They'll be able to tell in a while. You run your hand through your hair for the 30,000th time in an hour.

Thunder-lined memo

At 10:15 a.m., you get a memo from the office of the CEO. You're sure he is unaware of the situation, but his memo is ominous. It reminds you that the company is preparing to send its annual report to the printers, so the accounting and marketing departments need their printouts today to verify any last-minute changes.

Wonderful. The head of the marketing department has been harping on you for two weeks to be ready today, because he's got the printer standing by, and he's on a very close timetable. A missed day could set the project back by as much as two weeks.

Noon. Your entire staff, except for the three maintenance people, have gone to lunch. They have done no work — just watched the work load pile up. Your department is now nine hours backlogged, the equivalent of one working day. You have turned down three report requests and informed the CEO, COO, CFO and the marketing and accounting departments that your computer system is in-

Continued on page 20

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Newquist

CONTINUED FROM PAGE 19

operable, and the situation is grave. They are not pleased.

At 1:27 p.m., your maintenance people let out a shriek of delight. They have excised the disease, like surgeons removing a tumor. All data files have retained their integrity; nothing was seemingly damaged.

As they slap each other on their backs, the computer room goes back to work. There is no way that you're going to get marketing its printout today, and accounting needs its work first.

There goes the schedule for the annual report. Trying to tell them it is not your fault is like Nixon telling the nation he knew nothing about Watergate. It's your department, so it's your fault.

The three technicians start talking about the virus. "Boy, that guy sure knew what he was doing. He got in on the phone lines between shifts when no one was paying attention . . . ."

"Brilliant! His program was tiny, yet it grew to the size of Godzilla in about two hours! You gotta be a genius to be able to create something that monstrous . . . ."

While you listen to them extol the virtues of hacking, you calculate the costs of this genius' work. Two shifts of work where no work was produced. Nothing input, no output. Transactions for almost two full days are backlogged. A setback in printing the company's single most important yearly document.

Other departments are still waiting idly for needed reports in order to perform their corporate duties. They'll probably have until Monday, since today is Friday, and nothing is getting out of your department today, except accounting's printout.

You will need to bring in a shift during the weekend just to catch up on last night and today. There goes this month's data processing budget.

AS YOU CONTINUE to hear about the genius of the virus, your only thoughts are of revenge. Who would do this and why?

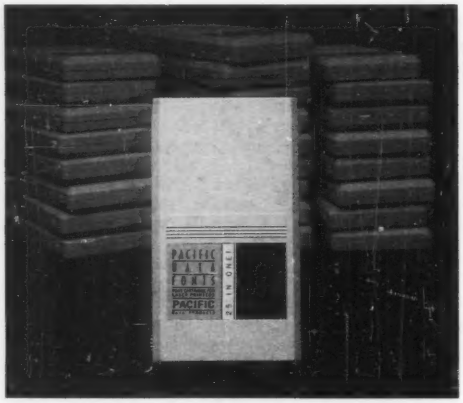
Your boss — correction, your bosses — are angry. They want a full review of the system and all of its shortcomings, implying that your operation is less than sound. There goes more money for an outside auditor.

As you continue to hear about the genius of the virus, your only thoughts are of revenge. Who would do this and why? Your sense of overexaggeration is gone.

This hacker invaded the sanctity of your domain, costing untold hours of your grief and the company's money. You now have a sense of proportion.

You wonder if anyone has ever taken out a contract on a hacker before.

103 Fonts and Symbol Sets!



BUY ONE. GET 24 FREE.

Buy all of these cartridges separately and you would spend over $5500. The "25 Cartridges in One!" has fonts for your LaserJet Series II printer.

A single cartridge with **103 fonts** and symbol sets, 13 typefaces, and 11 sizes of type for about the cost of one cartridge.

Buy the only cartridge you need for every application. Full support included for the new high-performance word processing packages. Excellent for use with WordPerfect® 4.2 and 5.0, WordStar,® Word,® MultiMate,® Samna,™ XyWrite,™ Lotus 1-2-3,® Excel,® PageMaker™ and Windows.™

PACIFIC
DATA PRODUCTS

Kirkley

CONTINUED FROM PAGE 19

that you could install a payroll system and see an immediate, massive reduction in head count.

"Today, we're looking at 'softer' justifications, and this is where top managers earn their money, making these tough decisions."

Top management must be told, he said, that a new system might be just the tip of the spending iceberg.

For example, an electronic mail system might have been initially installed for a simple, cost-justified reason; but users, being the intelligent, creative people they are, will quickly begin to find new applications for the system. Costs may soar. However, new and better ways of doing business should also emerge.

War veteran

One veteran of the corporate wars has devised a ranking of justification techniques based on degrees of subtlety. First is the "standard old situation" — justification based on return on investment, such as reducing head count, eliminating time delays, displacing old costs with new systems — particularly in telecommunications, she notes.

Next, is a substantial face-lift of systems or adding new functionality. For example, in the banking industry, old and unreliable money-transfer systems need to be replaced. Here, you use the rubric "modernization."

Finally, and most difficult to justify, are systems introduced on the basis that they will pay off, but not in any bottom-line, immediately tangible way. Building better customer information files, installing a decision-support system and cleaning up databases all come under this category. Here, she says, is where decisions are made on intuition and gut feelings backed up by years of experience.

In an ideal situation, the IS manager and top management would work together to devise information strategies. This joint planning would include a cooperative budgeting process. Justification would be a moot point.

But in the real world, there will always be those managers looking at you down the barrel of their gold pens, asking you, in a tone of voice that suggests your answer will never be quite satisfactory, to justify your existence.

Tired Of Just Treating The Symptoms Of Multi-Vendor Network Management Pains?

Tired of the bandage approach to Network Management?

Finding it hard to stomach the usual File Transfer problems?

Feeling uneasy about Network Access and Security?

Looking for relief from Help Desk headaches?

Losing sleep over Computer Operations nightmares?

Our NET/MASTER™ Seminars Will Help You Find The Cure.

It's our free "Solutions In Multi-Vendor Network Management" Seminar Series. In one morning, it can show you how NET/MASTER can ease the symptoms and ultimately get rid of your network problems.

You'll hear an on-target analysis of today's multi-vendor network environments. Also, learn how to simplify management of your own network —from James G. Herman, a leading consultant in the design, management and operation of mixed-vendor and mixed-system networks.

THE NET/MASTER™ SEMINAR SERIES

City	Seminar
Boston	February 14, 1989
Toronto	February 15, 1989
New York/ New Jersey	February 16, 1989
Philadelphia	February 17, 1989
Washington, D.C.	February 21, 1989
Cincinnati	February 22, 1989
St. Louis	February 23, 1989
Chicago	February 24, 1989
Dallas	February 28, 1989
Los Angeles	March 1, 1989
San Francisco	March 2, 1989

And, you'll see a demonstration of NET/MASTER, the system that's "three to four years ahead of NetView," as stated by Gartner Group's Michael Braude.

Don't suffer from multi-vendor network pains any longer. There's a better solution. Call us today for more information, or to register. But hurry—space is limited!

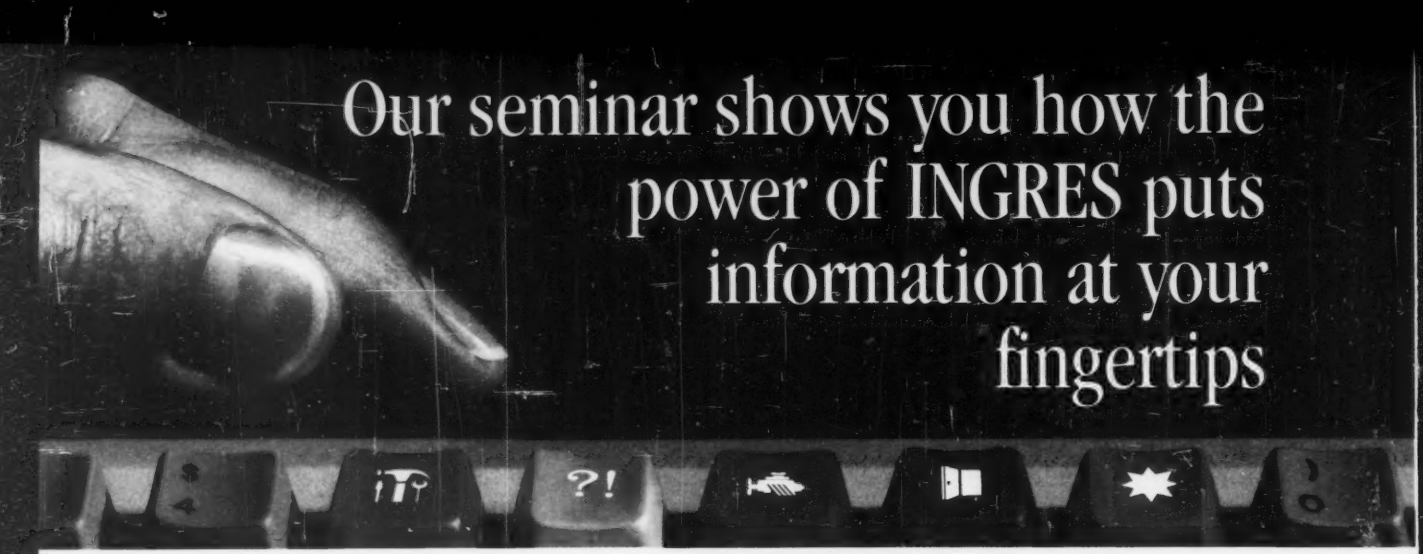
1-800-543-3010

In Ohio, 513-661-6000 • In Canada, 1-800-387-5914

CINCOM®

The Better The Solution, The Better The Value.™

© 1989 Cincom Systems, Inc.



Our seminar shows you how the power of INGRES puts information at your fingertips

Only INGRES Relational DBMS and 4GL give you the solutions you want on the computers you use

If you're in charge of MIS, or are involved in the evaluation and selection of a data-base system, here is your opportunity to learn about the most advanced integrated Relational DBMS and 4GL ever.

In just a few hours, you'll know more about how to evaluate today's systems than you ever knew before. Because, after that, you'll be comparing all other systems to INGRES's Total Performance Architecture™.

Total Performance Architecture (TPA) combines Tools, Power, and Access for applications development, transaction processing, and seamless information access. INGRES can be implemented transparently across over 40 hardware and operating system platforms including DEC, IBM, and UNIX, from mainframes to PCs.

TOOLS

Minimize backlog and cost with 4GL Application Development Tools.

INGRES's powerful 4GL tools help a major consumer products company save on applications development costs. INGRES has the only full-function 4GL tools which are tightly integrated with our SQL RDBMS and are instantly portable across PC, UNIX, VAX, and IBM platforms. INGRES visual programming methods facilitate rapid prototyping and modification.

Access information faster and easier with INGRES Query and Reporting Tools.

INGRES Query and Reporting Tools are used by a telecommunications company. INGRES reduces the learning curve with easy-to-learn, "fill-in-the-form" interfaces which allow direct access to critical information. INGRES SQL also interfaces with popular programs like Lotus 1-2-3, so users can leverage existing knowledge to become productive right away.

POWER

Support OLTP applications with the INGRES Multi-Server™ Data Manager.

The INGRES Multi-Server Data Manager is the only Relational DBMS to provide scalable OLTP performance across single, clustered, multi-processor, or networked CPU configurations. With its unique AI-based Query Optimizer, INGRES helps one of the world's leading business and consumer electronics companies vastly improve overall system performance.

ACCESS

Apply INGRES RDBMS power to older file management systems with INGRES Gateways.

INGRES Gateways give a pharmaceutical company direct access to data trapped in an older file system and the ability to combine that data into new relational applications. INGRES Gateways allow access to data across different file formats (such as dBASE III and RMS). No other relational database offers these instant links to older data files.

Integrate islands of information into a distributed resource with INGRES/STAR.

Using INGRES/STAR, an international financial giant links information systems in the United States, Europe, and Japan. INGRES/STAR provides the most advanced distributed database management system available today and improves access while reducing complexity and costs for hundreds of applications from the shop floor to the board room.

Through technical presentations, case-studies, and live demonstrations, you'll see how the features of each INGRES product meet the challenges of today's MIS department from applications design and prototyping through implementation and maintenance.

We'll present specific case-studies showing how INGRES has served the needs of thousands of companies worldwide by improving development productivity by a factor of five, reducing life cycle maintenance costs, and providing true applications portability.

So, if you're a decision-maker involved in evaluating and selecting database systems, come and see why Fortune 500 companies worldwide are using INGRES to meet their MIS needs.

U.S. SEMINARS

CA
Los Angeles . . . . . Feb. 8
Mar. 14
San Francisco . . . . Feb. 9
San Diego . . . . . Feb. 14
San Jose . . . . . Feb. 7
Mar. 15

CO
Denver . . . . . Feb. 8

CT
Hartford . . . . . Feb. 22

DC
Washington . . . . Feb. 9
Feb. 17
Mar. 22

GA
Atlanta . . . . . Feb. 7

IL
Chicago . . . . . Feb. 2
Mar. 23

IN
Indianapolis . . . Mar. 14

MA
Burlington . . . . Mar. 23
Cambridge . . . . Feb. 2

MI
Detroit . . . . . Feb. 21

MN
Minneapolis . . . . Feb. 15

MO
Kansas City . . . . Feb. 23
St. Louis . . . . . Feb. 16

NC
Raleigh . . . . . Feb. 23

NJ
Princetown . . . . Feb. 14
Saddle Brook . . . . Feb. 8

NY
Albany . . . . . Feb. 15
New York City . . . Feb. 21

OH
Cincinnati . . . . Mar. 23
Cleveland . . . . . Mar. 8

OK
Tulsa . . . . . Feb. 9

OR
Portland . . . . . Feb. 22

PA
Philadelphia . . . Mar. 23
Pittsburgh . . . . . Mar. 8

TX
Dallas . . . . . Feb. 7
Houston . . . . . Feb. 14

UT
Salt Lake City . . . Feb. 16

WA
Seattle . . . . . Mar. 14

WI
Milwaukee . . . . . Feb. 16

CANADIAN SEMINARS

ALB
Calgary . . . . . Mar. 14

BC
Vancouver . . . . . Feb. 7

ONT
Ottawa . . . . . Mar. 9
Toronto . . . . . Feb. 9
Mar. 21

QUE
Montreal . . . . . Feb. 2
Quebec City . . . . . Mar. 8

To register, call toll-free (in the U.S. and Canada) at:

1-800-4-INGRES (1-800-446-4737)

ASEM840CW

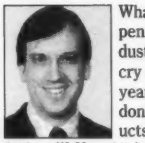
INGRES
RELATIONAL TECHNOLOGY
1080 Marina Village Parkway, Alameda, CA 94501

© Relational Technology. Registered trademarks: IBM (International Business Machines Corporation), VAX, RMS (Digital Equipment Corporation), UNIX (AT&T), LOTUS 1-2-3 (Lotus Development Corporation), dBase III (Ashton-Tate Corporation). INGRES, Total Performance Architecture, INGRES Multi-Server are trademarks of Relational Technology. Printed in U.S.A.

HARD TALK

Stanley Gibson

The changing of the fads



Whatever happened to the industry battle cry of a couple of years ago: "We don't sell products, we sell solutions"? You don't hear it so much anymore.

On the contrary, the wheel has come full circle. Now the rage is, "We sell the best/fastest/most powerful products." Benchmarks, of course, are part of the current marketing craze.

The idea of selling a soup-to-nuts package that was part of a partnership in which the performance of products was a marginal issue seems to have fallen by the wayside. In the world of today's generic products, you need the optimal generic product. Forget the intangibles.

Are we in the middle of a fad, which, like many fads, is itself a counterfad to the previous fad? Probably. But there is more to it than that. Users are unquestionably looking for reliable yardsticks to measure vendor claims. Users are looking closely at performance benchmarks in an effort to get the most for their computing dollar.

Increasingly, users are being asked to play the role of sys-

Continued on page 27

Step closer to home

Cray used to speed mortgage processing process

ON SITE

BY JAMES DALY
CW STAFF

NEW YORK — When Cathy and John Doyle move into their first home in Lakewood, N.J., later this year, they can thank not only years of hard work and squirreling away their cash, they can thank a Cray Research, Inc. supercomputer.

The reason? Players in the fast-paced financial markets, into which their mortgage has been cast, demand the lightning-speed processing of a Cray supercomputer to help them make investing decisions.

The mortgage payment they tuck into an envelope and mail off to their local bank each month is just one tiny part of an enormous pool of such mortgages that are bought up by individual investors. But the mortgages are only purchased when the investors feel the price is right. At investment house Goldman, Sachs & Co. in New York, that is where the Cray steps in.

"Last year, the simulation model we used to determine the risk involved in investing in these securities took 48 hours to run on a Digital Equipment Corp. VAX. We've cut that down to 10 minutes," said Scott F. Richard, vice-president of mortgage securities research at Goldman Sachs. The firm now rents time on a Cray II to help handle complex risk-simulation models.

In the 1970s, a new type of security rapidly gained investor favor. Mortgage-backed securities begin when a home buyer receives a mortgage from a local lending institution. The lender then combines many such mortgages into a pool often worth $1 billion or more, slices up the mortgage IOUs and sells them to investors in the form of certificates.

Goldman Sachs' Richard

As the home owners make monthly payments on their loans, owners of these certificates receive a share of the prin-

Continued on page 26

Apollo says its supers are best

BY JAMES DALY
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. claimed that its Series 10000 Personal Supercomputer bettered the performance of a bevy of heavyweight competitors in a recent spate of performance challenges on both the East and West Coasts.

However, the tests were conducted by Apollo — not by an independent auditor.

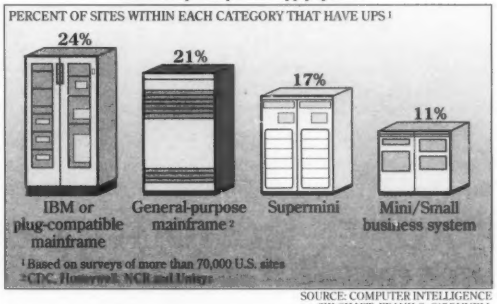
In an effort to buttress its claim that the Series 10000 brings the power of a supercomputer to the desk top, the work-

Continued on page 27

Data View

UPS absent at most sites

Companies with bigger computer systems more often use uninterruptible power supply systems



SOURCE: COMPUTER INTELLIGENCE
CW CHART: FRANK C. O'CONNELL

HARD BITS

Alliant signs NTT deal

NTT Data Communications Systems Corp., a subsidiary of Nippon Telegraph and Telephone Corp. in Japan, recently purchased $10 million worth of **Alliant Computer Systems Corp.** supercomputers. The Alliant FX/40 and FX/80 parallel processing systems will be used by NTT Data to expand its data communications network.

Alliant also said it shipped graphics display stations to China. The 50 Alliant display stations are part of a $12.5 million package that **Geoquest Systems, Inc.** in Houston is selling to the Chinese government. Geoquest is providing hardware and software for use by the China National Offshore Oil Corp.

Continued on page 27

Inside

- OSF touts graphical user interface. Page 25.
- BASF brings ¼-in. tapes to U.S. Page 25.
- Clearpoint Research announces Sun memory devices. Page 28.

IBM Business Partner

PLATINUM Database Analyzer™ for DB2

One of the problems confronting you, the DB2 DBA, is managing the physical DB2 objects within your DB2 system(s). To maintain an efficient DB2 system, you must tune the object's definition, monitor the space usage and growth of the objects, and verify the integrity of the objects.

However, DB2 does not provide the facilities necessary to perform effective management of your DB2 physical objects. DB2 does not maintain sufficient space statistics or space usage history, provide update activity and freespace usage information, or provide a mechanism for verifying the integrity of DB2 objects and easily correcting problems when they occur. DB2 provides statistics for optimizing SQL SELECT statements, not for managing the DB2 objects. DB2 leaves that dirty task to you.

PLATINUM's Database Analyzer is a DB2 DASD and Database monitoring, analysis, verification, and tuning tool. It provides you with all the necessary tools to manage physical DB2 objects.

PDA is the most comprehensive set of tools available for managing DB2 objects, all in one package, all from one vendor.

Call for more information and a free copy of The PLATINUM Reference™ for DB2.

1-800-442-6861

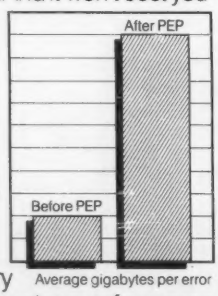
PLATINUM *technology, inc.*
The DB2 Company™

555 WatersEdge Drive Lombard, IL 60148 (312) 620-5000

The DB2 Database Watch Dog

Protect your library's performance with this free BASF program.

How well do your 3480-compatible drives and library perform? Now you can get accurate and comprehensive reports that pinpoint current and potential problem areas. And it won't cost you an extra penny. When you order BASF Chrome Tape Cartridges, you can get our exclusive Performance Evaluation Program, or "PEP," a simple, all-encompassing approach to library maintenance and system performance evaluation. PEP is derived from your EREP diagnostic data, and provides six regular indices of performance trends, and determines whether or not your systems are running well.



Here's what PEP provides:

- Analyses of historic EREP information
- Graphic management reports
- Identification of all suspect media by volume serial number, device number, and time period.
- Notification of hardware problems
- Computation of actual system performance
- Theoretical data after purging

Using PEP data, you can keep your 3480-compatible drives and library at peak operating efficiency. For complete details, see your BASF representative today or call 1-800-343-4600.

BASF Corporation Information Systems
Crosby Drive, Bedford, MA 01730-1471

BASF

OSF adopts composite interface

DEC tool kit, Presentation Manager-like traits are primary elements

ANALYSIS

BY STANLEY GIBSON
CW STAFF

Striving to please the greatest number of developers and users as quickly as possible, the Open Software Foundation (OSF) recently announced a hybrid graphical user interface for its planned version of the Unix operating system. The choice, as anticipated [CW, Dec. 19, 1988], draws on a tool kit from Digital Equipment Corp. with user interface characteristics jointly submitted by Hewlett-Packard Co. and Microsoft Corp.

The work of DEC in recruiting independent software vendors to develop for the X User Interface (XUI), on which Decwindows is based, paid off in the selection process, according to participants. Richard Treadway, Decwindows program manager at DEC, said some 300 independents have been working with the development tools.

Meanwhile, HP and Microsoft's submission, which includes the behavior of Microsoft's Presentation Manager, was selected because many personal computer users who use the Presentation Manager will feel comfortable with the interface. "Our goal is to bring the PC users to Unix — also to say we are going to co-exist in a world of Presentation Manager and Unix-based systems," said John Paul, OSF director of development.

Part of the HP-Microsoft submission was a three-dimensional appearance feature, which can cause a box on the screen to look as if it is raised or depressed.

"If you look at the OSF offering in June, it will look like HP's New Wave, including the 3-D appearance. It will look like Presentation Manager with 3-D," Paul said.

The part of the graphical user interface that comes from DEC, the XUI-based development environment of Decwindows, will not be immediately apparent from the screen's appearance. Developers who have worked with DEC on its Decwindows program will notice no change. "If you were an independent software vendor writing an application, you will be dealing with the same thing," Paul said.

DEC is set to formally announce Decwindows tomorrow, although the firm actually began shipping Decwindows in December with Version 3.0 of its Ultrix 32 operating system. Development of Decwindows was complete six months ago, Paul indicated. "DEC delivered us the most mature, best-performing tool kit," he said.

OSF's John Paul *values timeliness*

Although the OSF could have chosen the totality of either

Continued on page 27

SOFT NOTES

Relational Technology offers Ingres Release 6.1 upgrade

Relational Technology, Inc. said it began volume shipments of its latest Ingres release, 6.1, which was designed for on-line transaction processing environments. The company said Release 6.1 is capable of 30 transaction/sec. on a Digital Equipment Corp. VAX 8700 — twice the performance of the previous Ingres release. It will be offered as a no-cost upgrade to existing Ingres users.

Thirteen computer companies, including Digital Equipment Corp. and Hewlett-Packard Co., the Open Software Foundation and MIT plan to develop a three-dimensional version of the **X Window System**. This will be achieved, the group said, by added a network protocol known as PHIGS/PHIGS Plus Extension to X. PHIGS, the Programmers Hierarchical Interactive Graphics System, is a 3-D graphics standard. PHIGS Plus is being proposed as an add-on standard to include lighting, shading, depth, depth cueing, advanced curve and surface primitives to the basic PHIGS.

Continued on page 26

BASF to peddle ¼-in. tape cartridges in U.S.

BASF Corp., which is a leading supplier of tape cartridges for IBM 3480 users, has announced plans to enter the U.S. ¼-in. tape market.

The organization, which has been selling ¼-in. tapes in Europe for a year, said recently that it plans to market the tapes primarily to microcomputer users, although it will offer the tape cartridges to mid-range system users as well.

The tape cartridges are compatible with the ¼-in. products supplied by 3M Corp., BASF said.

According to BASF, ¼-in. tapes are increasingly used in microcomputer-based environments, particularly networked workstation setups, for back-up purposes.

The cartridges, which are guaranteed for 5,000 passes, will be offered in five configurations, including the 5¼-in. size and the 3½-in. mini cartridge size. Those two sizes will be offered in different tape lengths and recording densities.

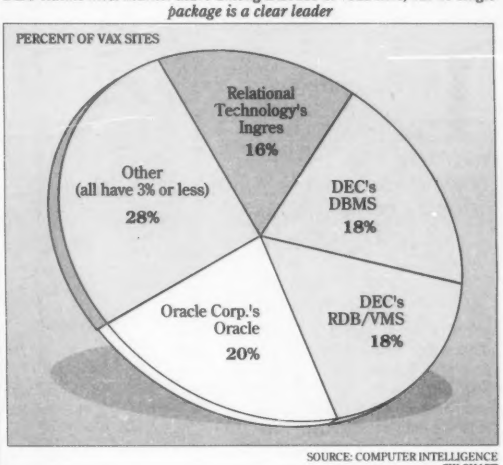
The tapes will be sold primarily through BASF resellers. Retail prices will range between $25 and $35 per cartridge, the company said.

BASF said the tape cartridges are available now in limited quantities. A spokesman said the company expects to be shipping the products at full volume within three to six months.

Data View

Four-way race

DEC claims most market share among DBMSs at VAX sites, but no single package is a clear leader


PERCENT OF VAX SITES
Relational Technology's Ingres 16%
DEC's DBMS 18%
DEC's RDB/VMS 18%
Oracle Corp.'s Oracle 20%
Other (all have 3% or less) 28%

SOURCE: COMPUTER INTELLIGENCE
CW CHART

CICSORT

Syllogy announces an online sort that will bring down the house instead of the system.

CICSORT FROM SYLLOGY. ONLINE SORTING FOR THE FIRST TIME EVER. For years no one would even think of doing a sort online. Because calling the batch sort would cause CICS to crash. That's about to change. Introducing CICSORT™. A remarkable new technology that now makes it possible and practical to sort online. **FAST.** CICSORT lets you get critical reports faster than ever. No more waiting for batch reports. Transfer them online. Create new reports in CICS. Or upgrade unsorted reports. **EASY.** CICSORT is called by the standard COBOL Sort verb. Programmers can put it to work immediately. And it's fully compatible with the CICS preprocessor, the OS/VS and VS COBOL II compilers and all versions of CICS. **EFFICIENT.** CICSORT is designed to operate at peak efficiency under CICS. Without affecting the performance of other jobs. **PHONE.** Find out what CICSORT can do for you. Call to receive our free booklet about online sorting and ask about our 30-day free trial. **TO LEARN MORE WRITE OR CALL 1-201-343-8900.**

SYLLOGY CORPORATION ONE UNIVERSITY PLAZA, HACKENSACK, NJ 07601

syllogy FOR INNOVATIVE SOFTWARE

Step closer

FROM PAGE 23

cipal and interest payments. The funds then reinvest the principal and send the interest as monthly dividends.

The banks issuing these securities insure them with one of several government agencies, the most popular agency being the Government National Mortgage Association — commonly known as Ginnie Mae — and the Federal Home Loan Mortgage Corp. — or Freddie Mac — Richard said.

Although these funds are backed by the "full faith and credit" of the federal government — if the mortgages default, the U.S. Department of the Treasury makes up the payment to investors — they are not totally risk free.

When interest rates fall, home owners rush to pay off their mortgages ahead of schedule and refinance at lower rates. Thus, mortgages may be closed out before all interest payments have been made, reducing investor yield.

Goldman Sachs evaluates the securities in a two-step procedure. First, a basic model of how and why home owners prepay was formulated, using a very complicated model and factoring in large data sets on such variables as interest rates and age of mortgages at prepayment.

> "IF IT'S going to be a useful managerial tool, we have to get the answer out within an hour."
>
> SCOTT F. RICHARD
> GOLDMAN, SACHS & CO.

This base model was formulated on a Cray X-MP/48 at the Pittsburgh Supercomputing Center last year by Richard, who is on leave from Carnegie-Mellon University's Graduate School of Industrial Administration, where he is a professor of finance and economics.

Using this information, Goldman Sachs figures out what mortgage rates should be and compares them with what is being offered to decide if they present an attractive investment option. "We compare what they're being sold at with what we think they're worth," Richard said.

This information is processed by a Cray II at the Minnesota Supercomputing Center in Minneapolis because it offers good service at a good price, Richard said. Goldman Sachs traders hook up to the center via telephone lines and a wide variety of workstations and personal computers. The investment firm is then charged for the system's rental.

The Cray machine handles work formerly done on either an IBM 3090, a DEC Vaxcluster or a Convex Computer Corp. minisupercomputer that the firm owned. But those models simply were too slow. "When I arrived here a year ago, the simulation model took two days to run," Richard said. "And I knew if it's going to be a useful managerial tool, we have to get the answer out within an hour."

The results so far have been dramatic. "Before, we used much smaller samples and simpler models" Richard said. "So not only have we gained speed, we've gained accuracy. What more could you ask for in a competitive advantage?"

Soft notes

FROM PAGE 25

Amoco Corp. in Chicago selected **Interleaf, Inc.** in Cambridge, Mass., as its provider of electronic publishing software. The organization acquired 500 licenses to the Interleaf software as well as system integration services.

Candle Corp. and **BGS Systems** signed a technical information exchange agreement. The companies said the deal will enable them to share information for development of both performance and capacity planning tools. Candle supplies systems information and performance measurement tools, while BGS markets capacity planning and modeling software.

You'll never have to wait for a mainframe again.

Microsoft just eliminated a 3000-pound headache for mainframe programmers. With Microsoft® COBOL Optimizing Compiler 3.0.

Now instead of endlessly waiting for mainframe time, you can bring your COBOL programs right down to the PC on your desk. Suddenly you've got control unknown in other platforms, as well as serious speed and power.

You've got full MS® OS/2 support to let you break the 640K memory barrier.

You've got fast execution because Microsoft COBOL is now a native code compiler.

You've got a rich development environment thanks to the Microsoft COBOL Animator source level debugger, Microsoft Editor and other powerful utilities.

One final assurance. Because Microsoft COBOL 3.0 is now mainframe COBOL compatible, you'll enjoy a seamless flow of source code between mainframe and PC environments.

Feel free to also enjoy the highly technical information in the adjacent column. Then call us at 800-541-1261 for more information and the dealer nearest you.

The mainframe wait is over with Microsoft COBOL 3.0. Appearing soon on a PC near you.

Microsoft®

© 1988 Microsoft Corporation. Microsoft, the Microsoft logo, MS and MS-DOS are registered trademarks of Microsoft Corporation. Microsoft COBOL Optimizing Compiler version 3.0 is based on COBOL/2 from Micro Focus.

Gibson

CONTINUED FROM PAGE 23

tems integrator in shops that are moving to standards. They want hard facts, not warm fuzzies.

The trend of computing hardware and software to become a commodity is real, and users are currently a driving force behind it. How quickly times change.

The commodity force is at work in the software industry, driven by Computer Associates International, Inc.

When CA was stalking Applied Data Research, Inc., (ADR) in the early summer, a wave of panic came across ADR employees, many of whom feared they would be cut in a purge of workers like those that followed other CA takeovers.

Of course at that time, ADR was reportedly hemorrhaging money. Its financial results were not broken out separately from its parent Ameritech, but the reports were not good.

The best that I have been able to piece together is that Ameritech did not know what it was doing in "managing" ADR. It let the firm spend freely on R&D and support. And much of that money was apparently spent fruitlessly.

ADR's liberal customer attention was very popular among end users. They feared the ruthless cost-cutting of CA would inevitably threaten this level of customer service, and they were worried.

I asked one user what would be worse, an ADR that continued as it had been and did not survive, or an ADR that cut back somewhat on support but did survive. "I hadn't thought of it that way," he answered.

If you were getting something for nothing and all of a sudden were to stop getting it, you might be displeased. But you shouldn't be surprised.

CA's cutting of excessive hand-holding would strike at the heart of ADR's problems. Although it might be a bit humbling for users to find themselves switched from a Cadillac to a Chevrolet, it is better to arrive in a Chevrolet than not to arrive at all.

Gibson is *Computerworld's* senior editor, software.

Microsoft COBOL Optimizing Compiler Version 3.0 for MS OS/2 and MS-DOS®

Complete COBOL Solution for Application Maintenance and Development on the PC.

- Develop and port large mainframe applications on the PC
- Break the 640K barrier with OS/2 support including dynamic link libraries and multi-thread support. NEW!
- Develop programs that run in both MS-DOS and OS/2. NEW!
- Compatible with several different COBOL dialects. (IBM® VS COBOL II,™ IBM OS/VS™ COBOL, IBM SAA, Data General, and others.)
- Call Microsoft C and Macro Assembler routines. NEW!
- HUGE memory model allows data items to be greater than 64K. NEW!
- Full network support with record and file locking including Novell. NEW!

Powerful COBOL Development Environment

- Animator source level debugger. NEW! Trace execution, backtracking, breakpoint DO statements, and periodic breakpoints.
- Microsoft Editor, the programmer's editor for both MS OS/2 and MS-DOS. NEW! Reconfigurable and extendable editor that even lets you run your programs from within it.
- Incremental linker for MS OS/2 performs partial links up to 20 times faster than a full link – only changed modules are relinked. NEW!

ANSI 85 COBOL support. NEW!

- Certified HIGH by National Bureau of Standards.
- Structured language enhancements:
  Scope delimiters
  In-line PERFORM statement
  CALL BY CONTENT statement
  EVALUATE statement
  Negated conditions
  Global variables
  Reference modifications
  Nested programs

Native Code compiler with fast execution. NEW!

- 10x faster computations than MS COBOL 2.2.
- 30% faster I/O than MS COBOL 2.2

OSF

CONTINUED FROM PAGE 25

DEC's or HP's submission, which would have been available right away, the group opted for a combined interface, which is an improvement over either of the separate offerings, according to Paul.

He added that the hybrid interface should be completed and available in six months, a lead time he called acceptable. "Timeliness is important. Our members said pick something you can deliver," Paul said.

Paul said Open Look, the graphical user interface of AT&T (the OSF's archrival in the struggle to establish a standard Unix), was one of 23 user interface submissions that conform to the OSF's published mandatory guidelines. "And their business terms were acceptable," Paul added. However, he declined to comment on why Open Look was not chosen.

DEC and HP both claimed victory because parts of what they submitted were accepted. Both asserted that the choice will help establish Decwindows and New Wave as standards.

"HP is pleased because it gets a user interface that is consistent with that of New Wave, something that was needed to make New Wave the standard they wanted it to be," said Nick Fowler, marketing manager for user interfaces at HP.

"The hybrid is both technically superior and politically palatable," he added.

"The engine and drive train are the same, although the decoration and dashboard are new," DEC's Treadway said.

The only differences

According to Treadway, there are only two differences between the Presentation Manager-type interface chosen and the Decwindows interface that was not chosen.

Under Presentation Manager, a user may operate without a mouse, which is not possible with the Decwindows interface. In addition, the method of invoking menus with the mouse is slightly different.

Paul said there are other differences as well, although the two mentioned above are the most significant.

Apollo

CONTINUED FROM PAGE 23

station maker pitted a reduced intruction set computing-based Series 10000 against an Amdahl Corp. mainframe, Convex Computer Corp. and Alliant Computer Systems Corp. minisupercomputers, Digital Equipment Corp. minicomputers and Sun Microsystems, Inc. workstations.

Fortran-based mathematical programs, isothermal flow application, a designer's matrix multiplication and circuit stimulation programs were all run during the November tests. The results from these tests were recently announced by the company.

Apollo said its Series 10000 performed more than seven times faster than a DEC VAX 8600 minicomputer running a designer's matrix multiplication, six times faster than a Sun-4/260 workstation running a Fortran benchmark and three times faster than a Convex C-1 minisupercomputer using a Fortran-based mathematical program.

Hard bits

CONTINUED FROM PAGE 23

Service & Training, Inc. will open a service center for **Data General Corp.** systems in Colorado Springs later this month. It plans to offer service rates that are as much as 40% less than what DG currently offers. The company plans to store replacement parts for systems, including the MV 15000 and MV 23000 as well as disk drives and other peripherals.

Encore Computer Corp. announced plans to sell its Annex Terminal Server product line to **Xylogics, Inc.** for $4 million in cash. Encore called the sale a "strategic financing move" to provide it with more funds to expand its Multimax Parallel Processing Computer System line.

The company intends to continue selling and supporting the Annex II Terminal Server product to its traditional customers.

Sun Microsystems, Inc. opened a subsidiary in Madrid, bringing the number of European offices to eight.

Amperif Corp. in Chatsworth, Calif., is offering a free one-year warranty program for its storage subsystem that is compatible with the Unisys Corp. Model 9200 Mass Storage System. With the Uptime Plus program, there is no charge for parts and labor during the first year. The package includes 24-hour service seven days a week.

Users are not charged an additional cost for weekend, holiday or after-hours service, the company said.

Tandem Computers, Inc. said its Nonstop CLX on-line transaction processing systems and V80 disk storage system were awarded the Good Design Prize for Foreign Products by the Japanese Ministry of International Trade and Industry.

Texas Instruments, Inc. said its research scientists in Dallas recently fabricated a quantum-effect transistor that is 1,000 times faster than conventional transistors.

The quantum-effect transistor is 100 times smaller than conventional versions. It operates on different principles than current transistors that govern the behavior of matter and dimensions of .02 microns or less, the company said.

TI cautioned that much work needs to be done before the ultrasmall transistors can be used. The techniques required to manufacture and interconnect the devices in production quantities have yet to be developed, the company added.

NCR Corp. recently signed a four-year deal worth $8 million with **Verifone, Inc.** in Redwood City, Calif., to sell its data collection terminals. NCR will market the Verifone terminals to U.S. manufacturing companies.

Storage Technology Corp. said it shipped a 4400 Automated Cartridge System to Fuji Heavy Industries, Inc., a manufacturer of Subaru cars in Gunma, Japan. According to Storage Tek, that shipment was the 250th of its automated product. The Automated Cartridge System is an 18-track cartridge-based storage and retrieval system that includes host software that resides on a mainframe with access to its storage library.

Apollo Computer, Inc. recently added 43 suppliers to its Apollo Partners Program, which is made up of value-added resellers and OEMs.

Eastman Kodak Co.'s Mass Memory Division selected **Aquidneck Systems International, Inc.** to manufacture controllers for its optical disk system, the 6800 Automated Disk Library, and standalone drive products. Kodak said it will be able to connect its optical drive to most minicomputers and mainframes with the Aquidneck controller.

The company said Aquidneck's product has been selected by several companies and government agencies, including the National Aeronautics and Space Administration and United Technologies Corp. as the optical archiving interface standard.

A **Sequoia Systems, Inc.** fault-tolerant computer was selected by **Richfood, Inc.**, a wholesale food distributor in Richmond, Va. The system will replace a Honeywell Bull, Inc. system, the company said. The $1 million Sequoia computer will process daily orders from 750 retailers in the Richfood network.

NEW PRODUCTS — SYSTEMS

Processors

Community Health Computing, Inc. has unveiled an integrated radiology information system, called **Radcare.**

The system reportedly encompasses several features, including information management, a financial system, diagnostic reporting (digital dictation and voice recognition), picture archiving and communications functions. According to the vendor, the product interfaces to the hospital information system and incorporates a fault-tolerant hardware platform.

Radcare is available on a client-specified, modular basis. Pricing depends on specific configuration.

Community Health Computing, Suite 2000, 5 Greenway Plaza, Houston, Texas 77046. 800-231-2604.

Data storage

Clearpoint Research Corp. has announced a series of Sun Microsystems, Inc. Sun 3/50-compatible memory devices.

Available in both 4M- and 8M-byte daughtercards, the **SNME-350** series reportedly allows users to expand their Sun 3/50 systems to a total of 8M or 12M bytes. The boards are said to be customer-installable and require no soldering.

The SNME-350/4MB costs $2,995; the SNME-350/8MB is priced at $4,995.

Clearpoint, 99 South St., Hopkinton, Mass. 01748. 508-435-2000.

A disk processing system specifically designed for use with super and minisupercomputers, imaging computers and high-speed data acquisition systems has been introduced by **Storage Concepts, Inc.**

Concept 51 reportedly provides high-capacity storage via 5¼-in. disks and allows one disk-controlling unit to support up to 63 disk drives. The system is packaged in a single rack-mountable chassis that incorporates a controller unit, data buffer, system power and cooling and over 6G bytes of storage.

The product supports several buses, including Digital Equipment Corp.'s Qbus and Unibus. Prices for the controller start at $17,900.

Storage Concepts, 1622 Deere Ave., Irvine, Calif. 92714. 714-852-8511.

Power supplies

Perma Power Electronics, Inc. has announced a 1200VA version of its standby power system for micro and minicomputers.

According to the company, the **SPS-1200** protects against data loss and equipment damage resulting from blackouts, sags and brownouts and automatically protects against overload without the use of special load meters.

The SPS-1200 costs $1,299.

Perma Power, 5601 W. Howard Ave., Chicago, Ill. 60648. 312-647-9414.

NEW PRODUCTS — SOFTWARE

System software

SDI Co. has announced an IBM VM product designed to improve system performance by caching the VSE lockfile in processor storage for immediate access.

According to the company, **Cache Magic XA/LF** eliminates the contention created by multiple VSE guests requiring constant access. The product carries a license fee of $8,500, and trial systems are available from the vendor.

SDI, 1700 S. El Camino Real, San Mateo, Calif. 94402. 415-572-1200.

Database management systems

Software designed to address batch problems for IBM DB2 users has been announced by **Relational Architects, Inc.**

Called **DB2/Batch**, the product reportedly can run DB2 programs directly in batch without the use of conventional IBM JCL and allows batch DB2 programs to work compatibly with job-scheduling packages and multistep job streams.

DB2/Batch costs $4,500 for a perpetual license or it can be rented for $270 per month.

Relational Architects, Suite 2341, 175 5th Ave., New York, N.Y. 10010. 212-966-0010.

AT&T and **Intercon Systems Corp.** have introduced a package designed to add multilevel security features to database management systems.

Called the **Trudata Model 3BBL**, the product is said to be compatible with AT&T Unix System V/MLS secure software and the Unix operating system. It incorporates audit trail facilities as well as tracking by terminal access, date, time and type of access, according to the vendors.

Reportedly developed for use with any DBMS that has an ANSI-standard SQL interface, Trudata Model 3BBL is priced from $20,000 to $40,000, depending on quantity ordered and system configuration.

AT&T, National Product Center, 1 Speedwell Ave., Morristown, N.J. 07960. 800-247-1212.

Are you Managing Micros by the Books?

The major PC trade journals agree that The Micro Resource Manager (MRM) is the recognized standard for professional micro management. MRM has earned the universal praise of micro managers, MIS directors, and software experts worldwide.

Here's what the "books" are saying...

PC WORLD — *"The beauty of MRM is that it serves as a self-contained environment for the business of micro management. . . . MRM is well conceived and designed, packing a great deal of power and flexibility. . . ."*

PCWEEK — *"Overall MRM is highly complex and powerful, but it's ease-of-use factors make accessing the valuable information it contains surprisingly easy." MRM "makes the task of tracking PC equipment not only possible, but also highly efficient and effective. . . . it is hard to imagine a system that would make those tasks easier."*

INFO WORLD THE PC NEWS WEEKLY — *"MRM does everything you could possibly want from a product like this and more. . . valuable, well-thought-out, and very powerful specialized database system for microcomputer managers."*

LAN TIMES — *Named MRM to their 1987 top 10 list of multi-user applications.*

MRM—A TOTAL SOLUTION

MRM is the most comprehensive and sophisticated software available for managing, supporting, and analyzing the use of microcomputers. Track hardware, software, peripherals, or services—by item or by system. Track PC's, minis, or mainframes. Analyze budgets and trends. Send memos to selected users. Log, track, and cost user requests for support.

Over **200 reports and queries** provide fast and flexible access to essential information in these key areas:

- Inventory Tracking
- On-line Tech Notes
- Configuration Management
- Network Config. Mgmt.
- Maintenance Management
- Problem Tracking
- Purchasing & Receiving
- Management Reporting

MRM has the features you need for increased efficiency and greater control. MRM also provides the high-level analysis of costs and use that management requires for strategic planning and long-term forecasting.

A FOURTH-GENERATION APPLICATION

Written in PROGRESS, a fourth-generation, relational database MRM's advanced user interface takes power and ease-of-use one step further than ordinary applications. Menus, windows, function keys, record scrolling, and "zoom" keys provide rapid cross-searching of data and effortless navigation through multiple data files. Rigorous data validation, automatic data base recovery, and multi-level user security ensure system integrity. Multiple report sequences and flexible selection criteria provide powerful ad hoc reporting. MRM is currently available on single-user MS-DOS, multi-user LANs, and VAX VMS.

GET INFORMATION FAST

With MRM's "borderless" database navigation, detailed information is always only seconds away. Imagine scrolling through a list of PC configurations, selecting the specific configuration you're looking for, and "zooming" into a summary of the components in that configuration. Then imagine selecting a specific component and "zooming" into the detailed inventory record. All the information you need—warranty, maintenance, purchasing data, etc.—is now at your fingertips. Finally, with a single keystroke, you can reassign that component to another configuration.

Call or write today for our FREE demo disk. Or better yet, order our one-hour MRM video.

These are just some of the organizations that have discovered the TOTAL solution to managing micros:

Abbott Labs
Air National Guard (77 sites)
Alcan Aluminum
American Airlines
American Reinsurance
Ashland Chemical
Bankers Trust Co.
Barclay's Bank
Baxter Hospital Supply
Bechtel
Blue Cross/Blue Shield
Cargill, Inc.
Caterpillar
Chase Manhattan Bank
Chemical Bank
Citibank
Coca Cola Co.
Contel
Cullinet
Enron
EPA
FAA
Fiat
Gannet
Grumman
Honeywell Inc
Hydro Quebec
IBM
ITT
James River Corp.
Levi Strauss
Library of Congress
Los Angeles Times
Manhattan District Atty.
Manufacturer's Hanover
Marine Midland Bank
Mckesson Corporation
Merrill Lynch
NARDAC
NASA
Naval Academy
Naval War College
NBC
Nordstrom
North American Phillips
Orion Pictures
Pepperidge Farms
Pepsi Co
Prudential Bache
Royal Insurance
Saatchi & Saatchi
Saloman Brothers
Scott Paper
Sotheby's
Sawran Financial
Statistics Canada
Super Value Stores
Time Inc.
Toys 'R' Us
United Airlines
Upjohn
US Army Corps of Engineers (23 sites)
US Dept. of Agriculture
US Dept. of The Army
US Dept. of Revenue
US Dept. of Labor
US Marine Corp
U.S. Navy

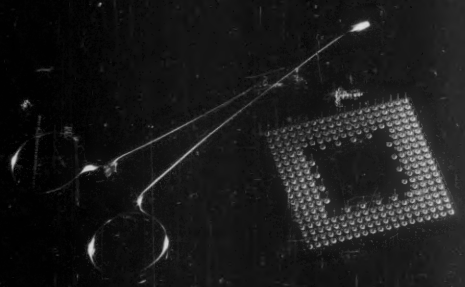
The Micro Resource Manager™

COMPUTER ASSOCIATES® Software superior by design.

200 West Lowe Ave., Fairfield, Iowa 52556
(515) 472-6400

PROGRESS is a registered trademark of Progress Software Corporation

AMDAHL PERFORMS WORLD'S LARGEST BRAIN TRANSPLANT.



STORAGE CONTROLLER

Ever since the first mainframe and the first storage device were invented, there have been a few unwritten rules.

1. *The mainframe gets all the brains.*
2. *The disk gets all the data.*
3. *These two are separated by a storage controller that has about as much problem-solving capability as a light switch.*

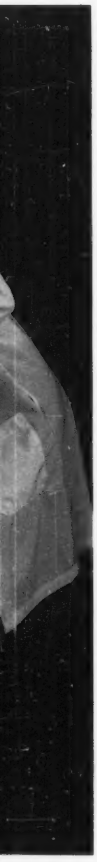
As a result, storage subsystems are less than models of efficiency. In fact, channel utilization is usually limited to 35% or less.

But at Amdahl, we've come up with a completely new approach to the problem. The Amdahl 6100 Storage Processor. Instead of a low-tech controller, we've made the Amdahl 6100 an incredibly intelligent solution.

In different configurations, it has 12 to 37 microprocessors, all dedicated to the job of making your storage subsystem a lot more efficient. And a lot easier to manage.

As a result, you can have a fully balanced storage subsystem. With up to four times the throughput. Twice the capacity. And shared cache capability. In fact, this new approach works so well that it can actually lower your overall cost per I/O and your cost per byte of data stored.

ER GETS 30 BRAINS.



Breakthrough approach creates storage system of '90s.

With all its intelligence, the Amdahl 6100 can control more resources creating a far more sophisticated storage subsystem. With 240GB capacity, 32 CPU attachments, 16 concurrent I/O paths, 16 device paths, 512MB shared storage, and 16MB nonvolatile storage.

With this incredible flexibility, you'll enjoy immediate advantages. You can tailor the 6100 to meet individual needs. And forget about tradeoffs between capacity and performance. With fewer storage subsystems, cabling to host CPUs is much simpler. And with 32 CPU attachments, multiple CPUs can access the integrated storage subsystems.

And those are just the immediate advantages. With all this power and capacity, the 6100 will provide for storage growth well into the '90s. And its processor design makes it easy to add new functional and performance enhancements to all 6100s.

DASD resources managed intelligently for first time.

With most controllers, connectivity has been limited to four lines in and out. So to keep access times down, DASD systems have suffered from poor use of disk space.

But now, with the 6100's microprocessors working full-time, you get up to 16 host data transfers, 16 device transfers, and sophisticated cache management. All of which lets you move data between host CPUs and the 6100 much faster. Up to 72MB/second. At the same time, you can reclaim a large percentage of previously unused disk space.

Shared cache needs less attention from specialists.

With the Amdahl 6100, you get up to 512MB of cache. But instead of being divided into fixed compartments, the 6100 dynamically adjusts to the environment. So you won't have to spend your time tuning across DASD strings to keep up with changing workloads. Instead, you can concentrate on more rewarding work.

Cost of operation hits all-time low.

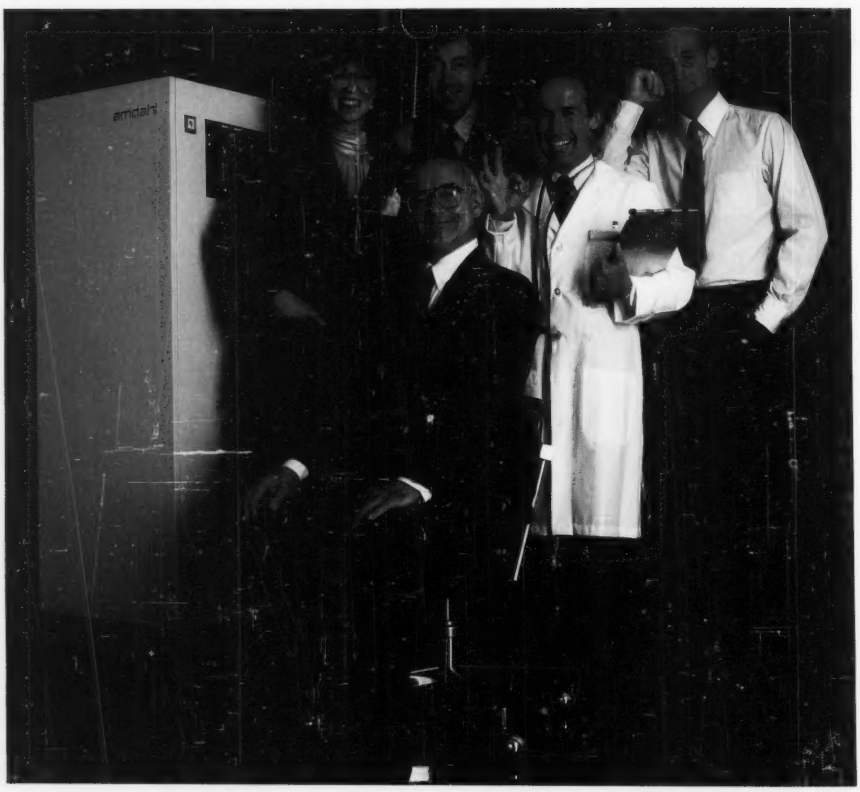
When you look at the big picture, here's the most revolutionary idea of all. Almost 50% of your total hardware budget goes for storage. And if you install our 6100 now, your storage subsystem will become a major contributor to a well-balanced system. Instead of just being necessary overhead.

Besides the benefits it brings to your storage subsystem, a balanced system can actually reduce the load on your CPUs. Which, in turn, can raise your productivity. And lower your overall cost of computing. All of which makes very good business sense. Just call your Amdahl representative. And we'll show you how smart a storage processor really can be.

amdahl

The Intelligent Choice

OPERATION SUCCESSFUL.



INTRODUCING THE WORLD'S FIRST STORAGE PROCESSOR.

Amdahl Corporation
1250 East Arques Avenue
Sunnyvale, CA 94088-3470

amdahl®
The Intelligent Choice

MICRO BITS

Douglas Barney

Pull out the crystal ball

More inane predictions. Every year, right around New Year's Day, a bunch of jerks in the industry take it upon themselves to predict the future, as if they know better than anyone else what will happen. I predict the same thing will happen this year. Other predictions follow:

- About one-third of my predictions will at least in some way be wrong — maybe more, in fact. Some will be correct, although probably due to a fluke.
- IBM will gain back personal computer market share. Decent values and the fact that the Micro Channel Architecture is now being exploited will help tremendously. IBM will also have a cheap 80386 machine that will sell very well.

Meanwhile, EISA — that gang of IBM competitors supposedly working on an alternative to the PS/2 — may actually create a new bus. It's just that no one will care.

- Although Excel will fail to make a major dent in Lotus' 1-2-3 sales, Microsoft will remain the largest PC software house, Lotus will remain No. 2, and Ashton-Tate will remain No. 3.

Continued on page 32

SQL not Dbase forte, test finds

Ashton-Tate promises to correct query flaws after competitor criticism

BY DOUGLAS BARNEY
CW STAFF

TORRANCE, Calif. — All along, critics argued that Ashton-Tate Corp. would not be able to produce an effective implementation of SQL in its Dbase IV product, charges the company vehemently denied. Now that Dbase IV is out, it seems the critics were right after all, at least regarding Ashton-Tate's first crack at SQL.

According to Fred Luk, president of Quadbase Systems, Inc., who has tested Dbase IV, users may get incorrect results from even simple SQL queries. Luk tested Dbase IV against his own product, Dquery, which provides Dbase III Plus with SQL capabilities. Ashton-Tate has not denied his findings and pledges to correct Dbase IV flaws.

With some queries, Dbase IV found an incorrect result. With others, it failed to run because of internal errors. At other times, Dbase IV's SQL gave inconsistent results depending on the method of querying.

Fortunately, an Ashton-Tate spokesperson said, some fixes should already be available through the Compuserve on-line service. Ashton-Tate officials also said the SQL problems are very data dependent, only cropping up when the product is used in unusual and specific ways.

The biggest problem for Ashton-Tate was its lack of SQL experience. Unlike many SQL developers with years of experience, Ashton-Tate had to build its complex SQL system nearly from scratch.

Another problem for SQL programmers is the lack of support for nulls — a way of dealing with missing data — said Fabian Pascal, an independent relational database consultant based in Washington, D.C.

Others have criticized the performance of the SQL. The central problem with the performance is that SQL was designed with so-called set processing in mind, where data is manipulated in entire tables. Dbase IV, however, maintains its record-at-a-time database engine. Translating between the two is both difficult and slow.

SQL bugs accompany problems in other areas of the product, including numerous incompatibilities with Dbase III Plus and problems with the Run command [CW, Nov. 12, 1988].

No browsing

Calculated fields (where data values are computed as entered) do not work properly either, said noted Dbase teacher Adam Green. Calculated fields work only with Browse and do not work with Edit of Append. Nor does the documentation match the product, Green argued. For example, the manual provides messages that the Range command is supposed to give. The range command, however, fails to provide these messages.

There is also little backward compatibility for Dbase IV users that take advantage of the new memo fields feature. Any Dbase IV database that uses memo fields can not be read by Dbase III, Dbase III Plus or any Dbase compatible.

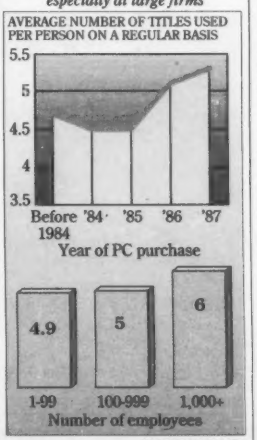
Although Ashton-Tate never promised full backward compatibility, the new memo fields will present a major problem for firms with a mix of Dbase III and Dbase IV users.

"People are going to have to share data," Green said. "There is not going to be an instant upgrade."

Data View

PC packages bigger in big business

Users are running more micro software titles than ever, especially at large firms



SOURCE: INFOCORP

Jaguar revs worksheets for 1-2-3

BY MICHAEL ALEXANDER
CW STAFF

Next month, end users will get a first-hand look at Jaguar and King Jaguar, two new spreadsheet compilers from Sheng Labs in Beaverton, Ore.

The two products are said to compile worksheets into executable files that are compatible with Lotus Development Corp.'s 1-2-3 and other spreadsheets, yet do not require that end users own the application program.

Jaguar and King Jaguar support 1-2-3 Versions 1.0a, 2.0 and 2.01. The company said it will also support Release 3.0 when it becomes available.

According to Sheng Labs, the spreadsheet compilers offer the advantages of speed, because the compiled application runs faster than interpreted programs, and security, because end users cannot alter the executable file.

Jaguar, which retails for $395, features a symbolic debugger that supports standard,

Continued on page 31

Inside

- Turning teachers onto computers. Page 31.
- Users form publishing bridge with Ami. Page 31.
- Wang pushes PC high end. Page 33.

If you answer Yes to two of these questions,

*A*re you developing mainframe COBOL, CICS or IMS applications?

*I*s your development environment sometimes counter-productive?

*W*ould you like to continue to program and test when the mainframe is down, slow, restricted or sixty miles away?

*W*ould you like to utilize the industry's best source code debugger to double your productivity?

*C*ould you develop CICS or IMS applications faster if you were free from the burden of TSO, poor response time and system crashes?

*D*o you want to develop and test massive programs and many megabyte data files on a PC without concern for the 640KB barrier?

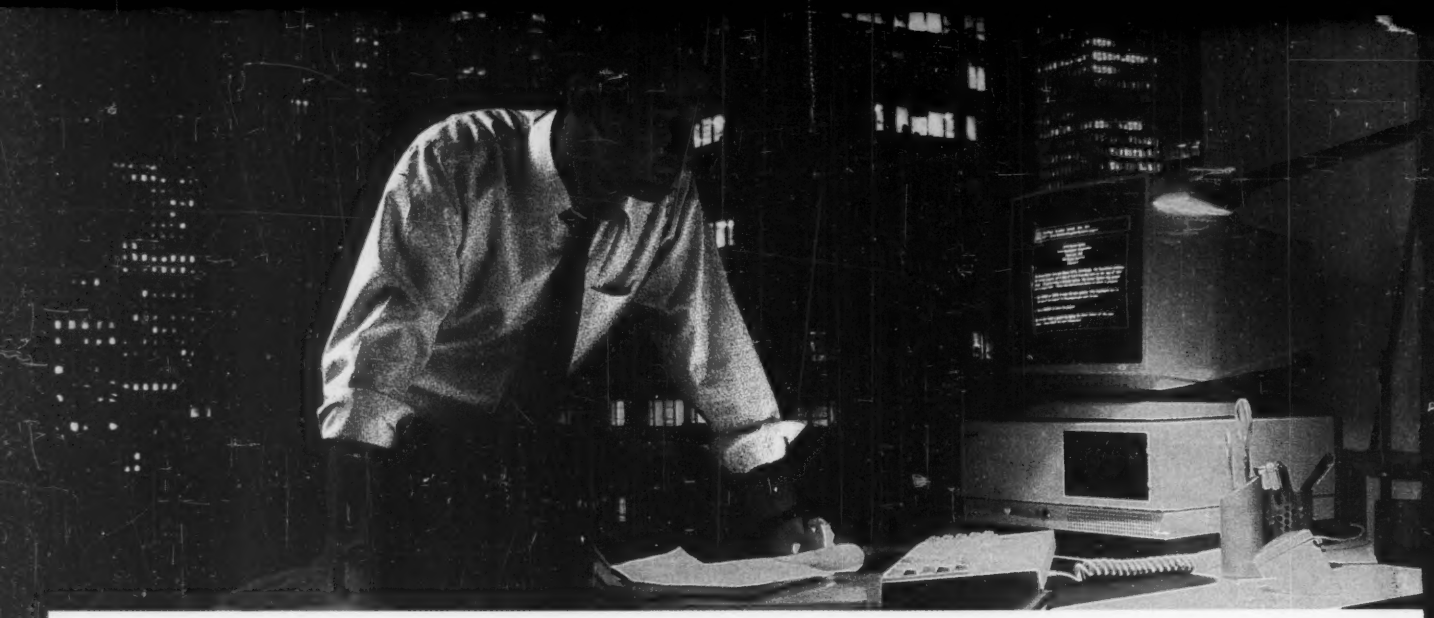
*C*ould you use a compiler that handles OS/VS COBOL, VS COBOL II, ANSI'85 or ANSI'74 COBOL just by setting a switch?

you have twice as many reasons as you need to order Micro Focus COBOL/2 Workbench.™

1-800-872-6265

MICRO FOCUS®

A Better Way of Programming™



"Taiwan's down again.
Somehow this is going to be my fault."

When the overall reliability and transmission quality of your data services are critical to your success, the services you choose for your company can be vitally important.

But it is nice to know you can depend on the AT&T Worldwide Intelligent Network for your communications services between the U.S. and other countries. This network is maintained internationally through the cooperation of PTTs around the world to provide high-performance transmissions.

With subsidiary offices overseas, AT&T offers you reliable customer service. So whether it's facilitating new service installment or keeping existing services operating smoothly and efficiently, you can count on AT&T.

AT&T is also committed to implementing state-of-the-art fiber optic technology along with a wide range of data, voice and video services. These services can enable you to globalize applications with accuracy and timeliness.

Let AT&T tailor services for your business needs and assist in long-range planning. Call your account executive, or the International Response Center at 1 800 448-8600, Ext. 349, and find out how AT&T can meet your needs in the international marketplace.

From equipment to networking, from computers to communications, AT&T is the right choice.

AT&T
The right choice.

©1988 AT&T

SMALL TALK

William Brandel

Unix winners and losers

The Open Software Foundation's (OSF) graphical user interface selection isn't for workstation users only. A closer look at the interface's ramifications indicates that it will have a distinct effect on the personal computer industry as well.

For those of you who were not glued to industry happenings over the holidays, the selected graphical user interface is a hybrid that includes DEC's X Window User Interface (XUI) as its application programming interface and HP's and Microsoft's Common X Interface (CXI) as its user interface (see story page 25). CXI is the look-and-feel portion of Presentation Manager/X (PM/X) and will essentially be a port of the Presentation Manager for OS/2.

The announcement is a boon to HP and Microsoft because it legitimizes their PM/X efforts. But more important is the challenge the OSF poses to Presentation Manager and OS/2.

Because of the Presentation Manager's current shortcomings and the viability of the PM/X and XUI hybrid, PC users may finally be given a sound reason to consider running Unix

Continued on page 32

Practicing what they teach

Math educators tool around with PCs, making learning fun for students

BY SALLY CUSACK
CW STAFF

Even math teachers have trouble practicing what they teach from time to time. But now, teachers at the University of Florida in Gainesville, Fla., are themselves using personal computers to learn how to turn kids on to numbers.

The PCs run software called ESC Elementary and Middle School Mathematics Curriculum, which is marketed by Education Systems Corp. in San Diego, Calif.

According to Mary Grace Kantowski, professor of mathematics education at the university, the program allows teachers to evaluate and practice the school's mathematics curriculum before introducing it into the classroom.

The program is unusual, she said, because "we're not teaching teachers about the computer; we're teaching them with the computer, so they can go back and teach their students with the computer."

Math overhaul

Kantowski, who is a 32-year teaching veteran, explained that the National Council of Teachers of Mathematics is developing new curricula and evaluation standards for grades one through 12.

More emphasis is being placed on teaching prealgebra, geometry, probability and statistics.

Kantowski added that many middle school teachers are not prepared to teach these subjects at that level.

Middle school teachers are also more prone to suffer computerphobia and misconceptions about the technology, Kantowski added.

If they are familiar with the personal computer, they tend to view it more as a word processor or number cruncher, not as a vehicle or medium for delivering instruction.

She also pointed out that most teachers rely on textbooks — not technology — as an intregral component of their instruction. Student teachers learn to teach with textbooks by designing lessons and practice teaching before they go on to actually teach a class of their own, she said.

"This program was designed to continue that experience but with software curriculum," Kantowski said. "It shows teachers how to extend the curriculum on the computer into the classroom."

She said she feels that one of the most valuable aspects of the program is that it gives teachers an opportunity to work extensively with material before they have to teach it.

Learn by seeing

Kantowski said the program's use of sound and colorful graphics is especially valuable to student teachers because it is "much more effective to be able to rotate a cube in actual 2-D or 3-D."

During the upcoming spring semester, Kantowski will instruct several area teachers two days per month on the system. The teachers will first learn the content and then construct material. Their goal is to learn how to present and integrate what they have learned into classroom activities.

The ESC program comes in a compact-disk format and is currently running on a local-area network at the university. The LAN consists of IBM Personal System/2s and Tandy Corp. personal computers, each with 640K bytes of memory.

Top sellers

Software: Dec. 26-30

1	Lotus' 1-2-3
2	Ashton-Tate's Multimate Advantage II
3	Software Publishing's Harvard Graphics
4	Wordperfect Corp.'s Wordperfect 5.0
5	IBM's Displaywrite 4
6	IBM's DOS 3.3
7	Fifth Generation Systems' Fastback Plus
8	Software Publishing's Professional Write
9	Borland International's Paradox 2.0
10	Ashton-Tate's Dbase III Plus

SOURCE: CORPORATE SOFTWARE, INC.
CW CHART

SOFT TIPS

Merging safely

When merging an Ashton-Tate Corp. Multimate file with a Dbase file, make sure the field names in the merge document are typed in exactly the same way as the field names in the Dbase file appear.

Multimate will not merge correctly if the field names are different, even if the cases are different.

Information provided by Corporate Software, Inc., a Westwood, Mass.-based software reseller.

Ami melds graphics, word processing

BY WILLIAM BRANDEL
CW STAFF

End users say they can bridge the gap between word processing and desktop publishing software with Samna Corp.'s Ami, a graphics-based word processing package.

Ami, which makes use of Microsoft Corp.'s Windows, enables users to perform graphics-oriented functions with a what-you-see-is-what-you-get type of environment.

John Fischer, corporate office systems manager at Helix Technologies Corp. in Waltham, Mass., needed a product that could begin adding windowing to his corporate office systems. Fischer said he is using Ami to ease these migration efforts.

"We're not a big Windows house and are still trying to decide what areas we want to use Ami in," Fischer said. "As [Ami] includes features of both word processing with some of the flavors of desktop publishing, we are relying on it while we're still in an in-between mode. There isn't another product like it on the market."

Andy Lipscom, president of East Valley Graphics, Inc., located in Rydal, Ga., agreed. "Unlike Microsoft's Write program, Ami performs real word processing under Windows," Lipscom said. "Samna has done an excellent job of taking advantage of windowing to create a word processing product."

Samna Corp.'s Ami

Price: $149

- Runs on Intel 80286 or 80386 systems
- Requires DOS 3.0 or higher, 640K bytes of memory and a hard disk

Lipscom, whose company designs graphics-based software, is using the product to process documents. He believes that Ami can replace Xyquest, Inc.'s Xywrite as *the* document processing system in the personal computing environment.

"Xywrite suffers from its ad hoc status," Lipscom said. "They started with a good editor and then added every conceivable feature available."

Negotiating through Xywrite's array of features is the key problem. "With Xywrite, you have to figure where the hell each of its added features are and then figure out how to use them. Ami was designed with ease of use in mind," he said.

But, Lipscom added, Ami is not perfect. Lipscom cites the users' inability to change documents from Xywrite to Ami as the product's most obvious flaw. This obstacle stems from the fact that Ami lacks an import file box that will accept the old Xywrite documents. But Lipscom said that he is aware that Samna is working on correcting this problem.

A Samna spokeswoman said that the interim version of Ami, which will precede the release of an Ami Professional offering, will enable the user to convert Xywrite files. The spokeswoman said that in the meantime, the product will accept Xywrite files in ASCII.

The Ami product, priced at $149, allows the user to select from pull-down menus and command options and get a real perspective of the document before it is printed.

The program also includes 25 different style sheets that can be used for layouts of memos, business letters, newsletters and reports.

Ami will run on an IBM Personal Computer AT or Personal System/2 and compatibles with Intel Corp. 80286 or 80386 microprocessors equipped with 640K bytes of random-access memory.

Jaguar revs

FROM PAGE 29

conditional and trace breakpoints; minimum recalculation technology, which speeds execution of an application; expanded memory support to enable end users to use worksheets too large for conventional memory; and support for Intel Corp. 8087 and 80287 math coprocessors.

These features are also included in King Jaguar, which retails for $595. It features a user-defined function that enables developers to define in C language functions not available in 1-2-3 and virtual memory that expands automatically to a hard disk when the application exceeds random-access memory.

Jaguar, King Jaguar and the compiled applications run on the IBM Personal Computer, XT, AT, Personal System/2 and compatibles with at least 384K bytes of RAM and require IBM PC-DOS or Microsoft Corp. MS-DOS 3.0 or higher.

Brandel

FROM PAGE 31

on their PCs.

As already voiced by users, Presentation Manager is flawed. It lacks device drivers and, therefore, does not yet support many of the popular monitors and printers. It lacks any software applications support. It requires a ton of memory and is optimized for Intel 80286-based machines.

In short, users must spend a lot of money for a system that really does not do anything. This means a slow ramp-up speed for Presentation Manager and affords a window of opportunity for the Unix community.

War is still on

After slowly gaining momentum and then being ravaged by consortium wars, one large faction in the Unix community has agreed on an interface based on the industry-standard X Window System.

According to major DOS vendors, the OSF interface has similar memory requirements to Presentation Manager.

But unlike Presentation Manager, the OSF selection is optimized for the machines it runs on. This gives the OSF interface a technical advantage and could possibly accelerate the Unix momentum in the PC market.

Some may argue that a Unix-based interface and its technical specifications are not significant to the PC market today.

But according to Tom Kucharvy, president of Boston-based Summit Strategies, who analyzes the high-end PC market, half of Intel processors being sold today can in fact run Unix.

With a solid interface technical specification to write to, it is entirely feasible that solid Unix applications for the PC could make it to market in the same time frame as those written specifically for Presentation Manager. Accordingly, those applications developed for Presentation Manager can be converted to run PM/X without a total rewrite.

These developments mean that Unix is now poised to make a run on the PC and also that users have an interface alternative that is superior to what is currently being offered to them.

Meanwhile, Presentation Manager faces some serious challenges in the PC industry's near future.

Brandel is a *Computerworld* senior writer.

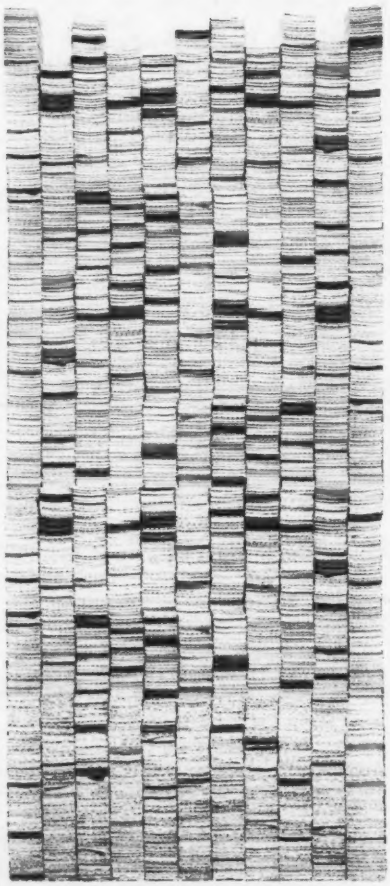
Barney

FROM PAGE 29

- Lotus, which has about 10 products still on the vaporware list, will ship about half of those. Release 3.0, 1-2-3/M, 1-2-3/G (very late in the year) and portions of Lotus DBMS will ship. The next release of Symphony, 1-2-3/Mac, 1-2-3/Unix and Notes probably won't. Lotus will have a decent year but a better 1990.
- Microsoft's relationship with IBM will show more cracks, but Microsoft will prosper anyway.
- A 386 version of OS/2 complete with the Presentation Manager interface will not ship, and no one will miss it.
- OS/2 itself will have a slow year. Presentation Manager applications will ship, but few will buy them.
- Unix will gain a lot of attention but will be used on few PCs.
- Windows will grow but will still be used on a minority of PCs.
- Dbase IV will get many of its bugs fixed and will sell well. However, Ashton-Tate will still lose market share to both new systems and ones based on older mainframe architectures.
- The chairman of at least one of the top five software firms will leave under pressure.
- The Mac will have a good year, but it will be the last year of strong growth for that machine once PCs and workstations start gobbling up Apple sales.
- Mainframe software kingpin Computer Associates will buy a major micro software firm.
- My infant daughter will not learn to use a computer.

Barney is a *Computerworld* senior editor, microcomputing.

Theirs.



The second most reliable impact printer did this much before it stopped. It wound up in the repair shop after 7,000 hours or ten months of printing.

© 1988 Hewlett-Packard Company

PE12805

NEW PRODUCTS

Systems

Wang Microsystems, a division of Wang Laboratories, Inc., has extended the high end of its PC 200/300 series with the introduction of two Professional Computer models.

The 16-MHz **PC 381** reportedly provides IBM Personal Computer AT compatibility and was designed to meet basic customer requirements in the business personal computer market. Pricing starts at $3,195.

The **PC 382**, running at 20 MHz, is especially suited for graphics and communications applications, the vendor said, and is priced from $3,450. Each system features an eight-slot chassis and offers 1M to 4M bytes of base memory, with upgrades to 16M bytes.

Both products are offered in a variety of configurations, including a broad range of memory, disk controller, fixed- and removable-disk storage and monitor support options.

Wang Microsystems, 10 Technology Drive, Lowell, Mass. 01851. 800-962-4727.

Software applications packages

Imagetech Corp. has acquired rights to the recently introduced **Marvin Software** personal computer-based imaging product.

The software reportedly enables users of IBM Personal Computer ATs, Intel Corp. 90386 machines and compatible systems to scan text and graphics documents, as well as store, retrieve and work with the digitized images. The package is menu-driven and mouse-oriented and runs under Microsoft Corp.'s Windows and MS-DOS. It operates with Canon U.S.A., Inc. and Fujitsu America, Inc. desktop scanners.

Marvin Software costs $695. Marvin Plus, which includes data compression and decompression logic functions, is priced at $895.

Imagetech, 1864 Northwood Drive, Troy, Mich. 48084. 313-362-3141.

Software utilities

A mouse enhancement product for users of Xyquest, Inc.'s Xywrite III Plus package has been announced by **Galactic Software, Inc.**

Called **Xymouse 2.11**, the software reportedly accelerates word processing tasks and integrates hard-disk inventory control functions. A hard disk is strongly recommended but not required.

Xymouse 2.11 costs $149.

Galactic, Suite 211, 2600 Philmont Ave., 1 Fairview Plaza, Huntingdon Valley, Pa. 19006. 215-947-0930.

Macintosh products

All-American Software Development Corp. has released an Apple Computer, Inc. Hypercard database management application.

Tabularium, according to the organization, was designed as a tool for importing data from Apple's Macintosh, DOS and mainframe databases into Hypercard.

The software imports to new stacks or adds to existing stacks, the vendor said, and is priced at $49.95.

All-American Software, 5612 International Pkwy., Minneapolis, Minn. 55428. 612-537-8910.

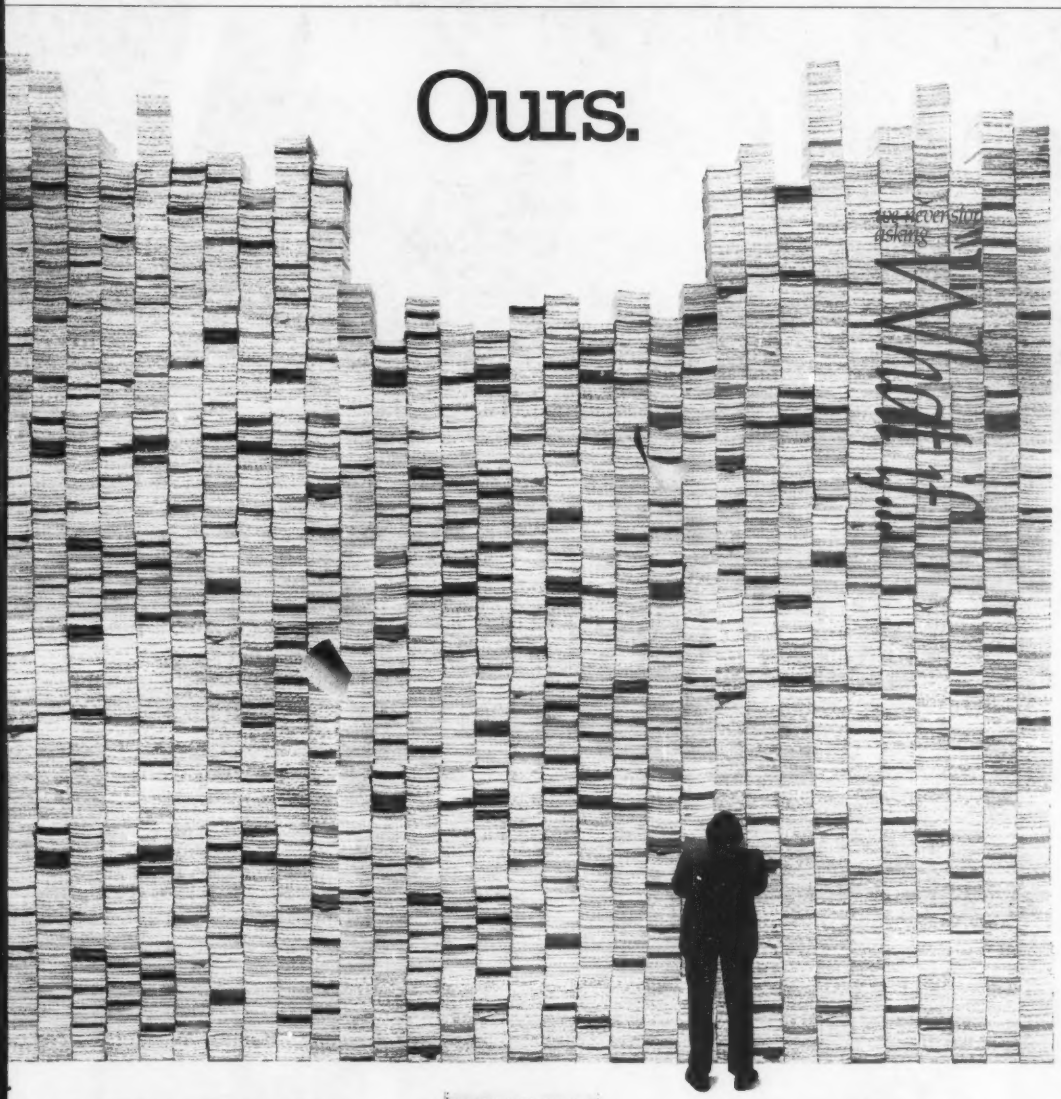
A color add-in board for Apple Computer, Inc.'s Macintosh SE system is available from **Orchid Technology, Inc.**

The **Colorvue SE** reportedly connects a Macintosh II monitor, an IBM Video Graphics Array monitor or a multisync monitor to the Mac SE.

According to the vendor, the product can provide up to 16 colors from a 256,000-color palette and is compatible with most eight-color Macintosh applications.

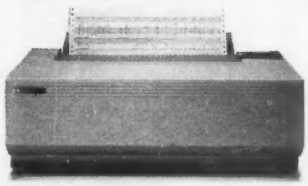
The Colorvue SE costs $695.

Orchid Technology, 45365 Northport Loop W., Fremont, Calif. 94538. 415-683-0300.



The HP RuggedWriter 480 printer did this much before we stopped counting. After the equivalent of 20,000 hours, it just kept working. And working.

Only HP could have built an impact printer as reliable. Or as fast. At 480 cps for draft and 240 cps for letter quality, you'll be able to turn out everything from letters and spreadsheets to six-part forms, at least 20% faster in letter quality mode than other 24-wire impact printers.



And with its 180 x 360 dot per inch resolution, it's certainly no slouch when it comes to graphics.

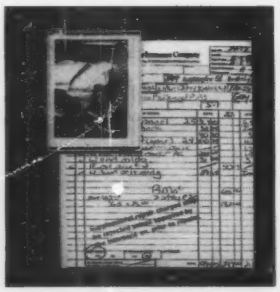
It's also compatible with the computer system you already have. IBM PCs. PC-compatibles. And of course, HP.

And compatible with your budget. At a price of just $1695.

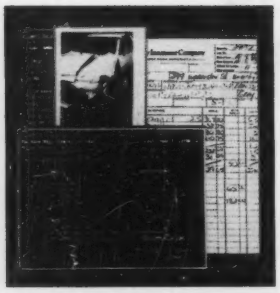
For more information, call 1-800-752-0900, Ext. B287. And you'll see why the competition just doesn't stack up.

HEWLETT PACKARD

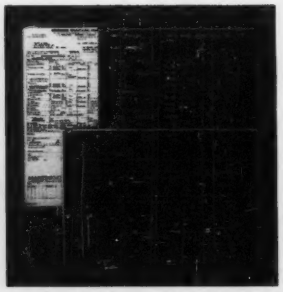
A BETTER IMAGE CAN DO WONDERS FOR CUSTOMER SERVICE. AND THAT'S NO IDLE CLAIM.



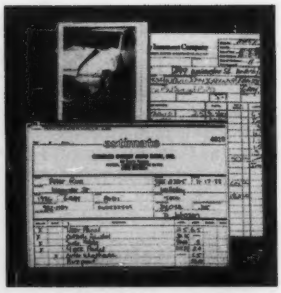
There's a fender bender on a freeway. The adjuster comes out and takes a picture of the damage. And signs off on an adjustment.



The handwritten document and the photo – the images – both go back to the home office via electronic mail.



Touch a button and you have a data window, a text window, an image window right in front of you. Presto!



A guy in the field wants to verify the estimate. Click! The adjuster's handwritten report, the estimate, and the photo are right there on the screen.

Actual Wang computer screens shown here.

Claims processing.

Until now, it's been pretty much a hit or miss affair. Waiting for documents, verifying estimates. Signing off adjustments.

But with Wang's Integrated Image System, you can process an accident claim in a fraction of the time.

INTEGRATED IMAGING

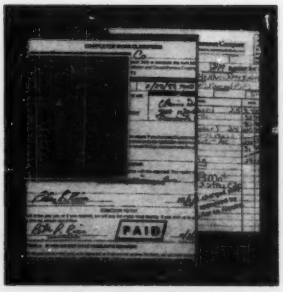
WIIS gives your people immediate access to the information they need, where and when they need it. In the office or in the field.

With the press of a button up comes an image window, text window, data window. Simultaneously. And it's integrated information. With your FAX machine. Your electronic mail. Your company's computer system.

Wang's Integrated Image System.

What it can do for your image it can do for your customer service.

And that's no accident.

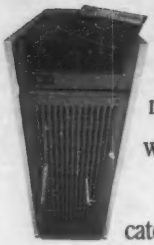


The entire claim processed in half the time.
That's Integrated Imaging and Wang has it!

WANG

MAKES IT WORK

For more information, contact your local Wang Sales Office.
Or write Wang Laboratories, Attn: Inquiry Service, M.S. 014-03C, One Industrial Avenue, Lowell, MA 01851. © 1989 Wang Laboratories, Inc.



Recently some of our competitors have been using the term transparent to mean just about anything. But at Banyan, we use it to mean something very specific.

It means that Banyan users can communicate directly from one PC to another, without any servers in the way. And that with our VINES™ network operating system, they can reach any resource, anywhere on the network, simply by knowing its StreetTalk™ name. Not its location. Not what server it's attached to.

Not even when Banyan users log on, do they have to recognize a server. Instead they log on to the entire network, because with Banyan, there are no boundaries between servers.

To find out how a network that's truly transparent can make a concrete difference in the way you do business, call 1-800-828-2404.

Other networks say they're transparent, but we can see right through them.

Want to use the new color printer? First you'll have to find out what server it's on, apply for a new profile, and log on every time you want to use it.

If the resources you need are on five different servers, you'll have to log into five different sessions.

They have a new name for user transparency. It's called a full-time administrator.

Sure they give you access to the mainframe. But first you'll need to cope with unrelated user interfaces, security, and administration.

You can reach Bob in L.A. But who knows what server he's on, or how to get there?

BANYAN Networks for those who think big.

Banyan Systems Inc., 115 Flanders Road, Westboro, MA 01581, (508) 898-2404.

DATA STREAM

Thomas L. Nolle

LANs: Closet data centers?

When asked in a 1982 survey what negative aspect of personal computer growth they feared most, data processing managers fretted over a potential loss of central information control. The managers believed PCs would encourage the "privatization" of information by erasing the traditional link to the central computer complex.

This image has stood the test of time: Recent advertisements by a minicomputer vendor portray this same image of data banditry but in the context of local-area networks.

We've survived the wholesale movement of corporations to PCs without realizing the worst of those 1982 fears, but most businesses can point to episodes in which there were problems because of the gradual diffusion of data into nonintegrated systems.

In fact, the problems that can occur when everyone owns a private database — unknown to others and not subject to any form of audit or verification — are one reason why the integration of work groups via PC LANs is a growing priority. But might the cure be a step toward a more serious disease?

Take a real-life example. In 1983, a major New York bank had to create special batch files to preserve data on its LANs in original form. Standard fea-

Continued on page 40

Mac link replaces mail at Arco

Remote gas depots uploading data to headquarters Appletalk LAN

BY JULIE PITTA
CW STAFF

LOS ANGELES — Atlantic Richfield Co. is looking to tie field operations to its headquarters with a modem-based link between depot users' Macintoshes and Macs on an Appletalk local-area network located here.

Today, users at Arco's gas depots are mailing their Apple computer, Inc. Macintosh disks filled with shipping information to the main office of Arco Products Co., the marketing distribution arm of Arco, headquartered here. The information is then loaded into Macs and sent to the company's Amdahl Corp. mainframe.

Mailing the disks from depots to headquarters has proven cumbersome and time-consuming, said Tom Mullaney, manager of systems and administration at Arco Products. So Arco is looking at Portland, Ore.-based Inforsphere, Inc.'s Liaison, software that would allow remote users to send information electronically from the depots into the home-office Appletalk network.

Macs on the Apple LAN are linked via "plain old telephone wire," according to Mullaney. There are two LANs composed of 50 Macintosh SEs at headquarters and two more connecting 30 Mac SEs at a separate site in Los Angeles, which serves as the main office for Arco's Paypoint system. Paypoint allows consumers to buy gas using their automated teller machine cards.

The four LANs are linked using Hayes Microcomputer Products, Inc.'s Interbridge, an add-on device that links multiple Appletalk networks via Hayes modems.

The Appletalk LAN at Arco Products' headquarters is connected to an Amdahl host using Tridata Corp.'s Netway 1000 gateway. The host stores customer files, pricing and tax charges and daily production records.

One obstacle to deploying the electronic file transfer application between the remote and local sites is the depots' current use of 2,400 bit/sec. modems.

The company needs to install 9.6K bit/sec. modems to surmount the current "interminable wait for data transfer," Mullaney said. He said he hopes to solve this problem with the latest release of the Applefax Modem, which is said to support file transfer at speeds up to four times faster than standard 2,400 bit/sec. modems.

Applefax enables users to send facsimile files to and from virtually any type of fax machine. It also enables users to exchange data files with other Macs equipped with Applefax modems. It was taken off the market in October to fix bugs in the software and firmware, but the revised version will ship as of Macworld later this month, according to Apple.

Other facets

An electronic link between depots and headquarters is only one of several ways that Arco is employing computers to increase the efficiency of its operations.

Using Macdraw II, Apple's drawing program, depot staff members create diagrams of various Arco service stations for delivery-truck drivers. "That way, he knows where the tanks are," Mullaney explained. "He can figure out the best way to pull in to reach them." The maps

Continued on page 38

Data seen increasing on T1 links

BY ELISABETH HORWITT
CW STAFF

MARLBORO, Mass. — Data communications, in particular IBM Systems Network Architecture transmissions, will make up an increasing percentage of the traffic carried by T1 multiplexers in the next two years, according to a recent study.

"The Multiplexer Market, 1988 — an End-User Assessment" is a study put together by The Market Information Center, Inc.'s Comm/Surv group.

The research firm, based here, surveyed approximately 325 U.S. organizations, of which nearly 30% used T1 products and services. Of those companies, 26.4% were Timeplex, Inc. users; 12.1% were AT&T users; 12.1% were General Datacomm, Inc. users; 7.7% were Digital Communications Associates, Inc. users; and 7.7% were Network Equipment Technologies, Inc. users.

More than 15 additional vendors supplied the remaining

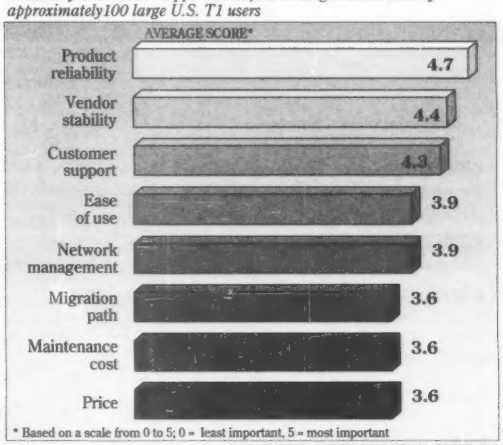
Continued on page 40

Inside

- U.S.-Soviet packet-switching link opened. Page 38.
- Aussie firm building world's largest private digital backbone network. Page 38.

T1and multiplexer shopping list

Reliability and vendor support come first among criteria cited by approximately100 large U.S. T1 users



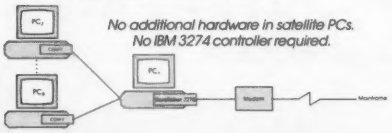
* Based on a scale from 0 to 5; 0 = least important, 5 = most important

SOURCE: THE MARKET INFORMATION CENTER, INC.
CW CHART

Link 8 PCs to Your Mainframe Only $2,395

DataTalker 3270 features
- File Transfer (IND$FILE)
- 12-32 Logical Sessions
- Application Programming Interface (API or HLLAPI 3.0)
- 3287 emulation for ASCII printers
- SNA or BSC Protocol

DataTalker Hardware Options:
- Modem boards (201C, 208A/B, V.22 bis)
- Co-processor boards (8088, 80186)
- Serial Interface Card
- PC/8 co-processor and MUX board



No additional hardware in satellite PCs. No IBM 3274 controller required.

Micro Channel and PC bus versions are available for all boards.

MSDOS-UNIX-XENIX

DataTalker 3270 now available for MSDOS, UNIX System V, XENIX and VENIX operating systems.

For a FREE micro-to-mainframe guide, call 800/666-3270

WINTERHALTER INCORPORATED
3796 Plaza Drive, P.O. Box 2180
Ann Arbor, MI 48106

An Interface Systems, Inc. Company

BIT BLAST

U.S.-USSR network opens

Jan. 1 saw the inauguration of a packet-switching data network between U.S. and Soviet Union users. The net was provided by **San Francisco/Moscow Teleport, Inc.** in cooperation with the **National Center for Automated Data Exchange** of the USSR. The network is said to make U.S. database services available to Soviet subscribers. It is accessible through several local carriers' services, as well as through **Globenet, Inc.**

Ungermann-Bass, Inc. has contracted to purchase IBM Systems Network Architecture products from **Rabbit Software Corp.** Under the agreement, the network vendor will pay Rabbit royalty fees over a two-year period.

Infotron Systems Corp. recently made its first shipment of Streamline 45s, which it claims are the first T3 networking multiplexers to be marketed. Two of the units, which reportedly support transmission speeds of up to 45M bit/sec., were delivered to **Sungard Recovery Services, Inc.**, a disaster-recovery service vendor.

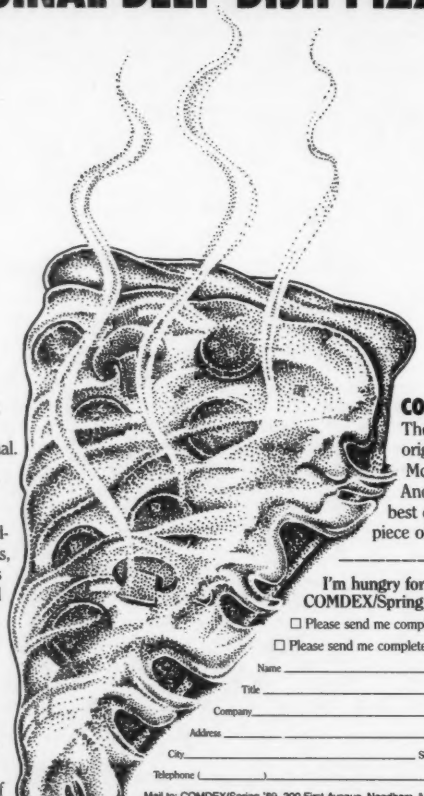
Cabletron Systems, Inc. has inked a pact with **LSI Logic, Inc.** to develop a 10BaseT-standard transceiver chip. Cabletron will have sole rights to market the new chip, which will support 10M bit/sec. Ethernet over unshielded twisted-pair cable.

3Com Corp. and France's **Telesystemes Reseaux** have signed an agreement to jointly develop an X.400 gateway and X.25 router. 3+Open Reach/X.400 and 3+Open Internet/X.25 reportedly will enable a mix of personal computers, including IBM Personal System/2s and Apple Computer, Inc. Macintoshs on 3Com networks, to exchange electronic mail via public E-mail systems and proprietary systems such as IBM's Professional Office Systems and Digital Equipment Corp.'s All-In-1. The two products are slated to be available in French and English by mid-year.

Prime Computer, Inc. has announced an X.400 tool kit said to allow 50 series supermini software programmers to develop E-mail, gateway and other messaging systems within local- and wide-area networks. Information can be formatted as text, graphics, digitized voice, image, facsimile and electronic data interchange transactions.

Future kits will support Unix-based systems and Ethernet LANs, the vendor said. The second phase of Prime's X.400 strategy entails an end-user mail implementation, with a PC interface slated to ship late this year.

FROM THE CITY THAT GAVE US THE ORIGINAL DEEP DISH PIZZA...



CHICAGO. The city that introduced that famous international culinary delight is about to host another international original.

COMDEX. The original computer distribution event of the computer industry.

COMDEX. Known worldwide as the leading forum for defining new industry trends, generating new opportunities for business growth and showcasing new products and ideas through an extensive conference series and a projected 1000+ exhibitor-filled floor.

COMDEX/Spring '89. The premier gathering place for resellers, industry leaders, key suppliers and new-to-market companies alike. As the year's first major marketing event, COMDEX/Spring '89 carries the record-breaking momentum of COMDEX/Fall '88. And will put you in the best position to profit in the coming year.

COMDEX/Spring '89. The computer industry original. Coming to McCormick Place, Chicago. And bringing with it your best opportunity for a bigger piece of the pie.

I'm hungry for more information on COMDEX/Spring '89.

☐ Please send me complete attendee information.

☐ Please send me complete exhibitor information.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____ CW19

Mail to: COMDEX/Spring '89, 300 First Avenue, Needham, MA 02194

☒THE INTERFACE GROUP, Inc. ® © 1988

World's Leading Independent Producer of Conferences and Expositions

Foreign Buyer Program

The More You Think About It, The More You Know You Have To Be There.

COMDEX/Spring '89

April 10–13, 1989 • McCormick Place, Chicago

Big doings down under

TOORONGA, Victoria, Australia — Coles Myer Ltd., a retail company based here, is building what reportedly will be the world's largest private digital backbone network.

The network will link Coles Myer's approximately 1,500 retail outlets throughout Australia, as well as planned sites on other continents, the company said. It is expected to supply the retailer's voice, data, image, text and video communications needs through the late 1990s.

Datacraft Australia Pty. Ltd. will design and install the backbone, which will be based on T1 multiplexers from Newbridge Networks Corp. The backbone will support the company's IBM Systems Network Architecture network, its Digital Equipment Corp. Decnet of Vaxclusters and a voice network made of NEC Corp. NEAX 2400 digital private branch exchanges.

One key feature of the Newbridge/Datacraft proposal was the use of Newbridge's 3612 Narrow Band Multiplexer, which allows voice and data transmissions to be integrated over one channel that supports 64K bit/sec. or lower rates, Newbridge said.

Mac link

CONTINUED FROM PAGE 37

are stored in a graphics database.

Performance information — including the number of miles trucks have traveled, how many hours those journeys took and the number of hours employees have logged on those trips — is recorded using Microsoft Corp.'s Works. Other data reported includes a daily record of how much gasoline is delivered and the safety records of each driver. Mullaney said between 400 and 450 gallons of gas are shipped monthly from Arco's storage depots. The bulk of the performance information is entered into Macs at those sites.

"They do the groundwork by accumulating the information that goes into our overall performance analysis," Mullaney said. That data is vital in determining the price of gas to the service station franchisees, he noted.

WITH SO MANY DIFFERENT OPERATING SYSTEMS TO CHOOSE FROM, WHERE DO YOU DRAW THE LINE?

IBM
HD
84X1415
IBM®
Operating System/2™
Version 1.00 © Copyright International Business Machines Corp. 1981, 1987
Licensed Material—Program Property of IBM—
All Rights Reserved
© Copyright Microsoft Corp. 1981, 1987
Note: U.S. Government users—RESTRICTED RIGHTS LEGEND. Use, Duplication, or Disclosure is subject to restrictions stated in contract No. GS 00K87AGS062.

©1988 3Com Corporation. 3Com is a registered trademark of 3Com Corporation. The IBM logo, IBM and Operating System/2 are all trademarks of Internation Business Machines Corporation. Microsoft is a registered trademark of Microsoft Corporation. The Apple logo and Macintosh are registered trademarks of Apple Computer, Inc. Digital Equipment Corporation and VMS are trademarks of Digital Equipment Corporation.

Nolle

CONTINUED FROM PAGE 37

tures such as record and file locking didn't stop people from making private copies of files and modifying them — resulting in multiple, inconsistent versions. No one had anticipated the problem, and it cost thousands to correct.

The bank was involved in an early distributed processing application, one of the very first to use PCs. The fact that the networks of that time did little to provide formal support for central database protection led users, vendors and consultants to approach with caution the development of applications that relied on those databases.

But this year, LANs will have technical facilities allowing them to be what many have claimed they were all along: substitutes for departmental or central information processing resources. That could give users a false sense of security in dealing with the kind of problem the bank had six years ago.

In products like Novell's System Fault Tolerance Netware, Microsoft's OS/2 LAN Manager, IBM's OS/2 LAN Server and the growing number of SQL servers, the state of LAN technology has advanced to create for the first time an environment in which basic DP controls over information storage and retrieval can be applied. These products provide transaction backout, ghosting/duplexing of disks to maintain parallel databases and activity audit trails developed through centralized smart servers. Such features will surely eliminate some of the barriers to making a LAN the equal of a minicomputer or mainframe.

Vendor literature seems to promise an environment that takes care of itself. It's a wonderful dream, but this encourages users to not think about the technology, and that's always bad. These new features are simply tools. The questions are who will apply them, enforce their use and regularly test their operation to ensure their continued integrity.

Nearly half the LANs in use today have no real centralized administration function. Sure, most have a designated administrator, but that person often does little more than assign passwords and access rights. In one manufacturing company, the administrator resigned and the position remained open for almost six months because no one knew it had ever been filled.

Get serious

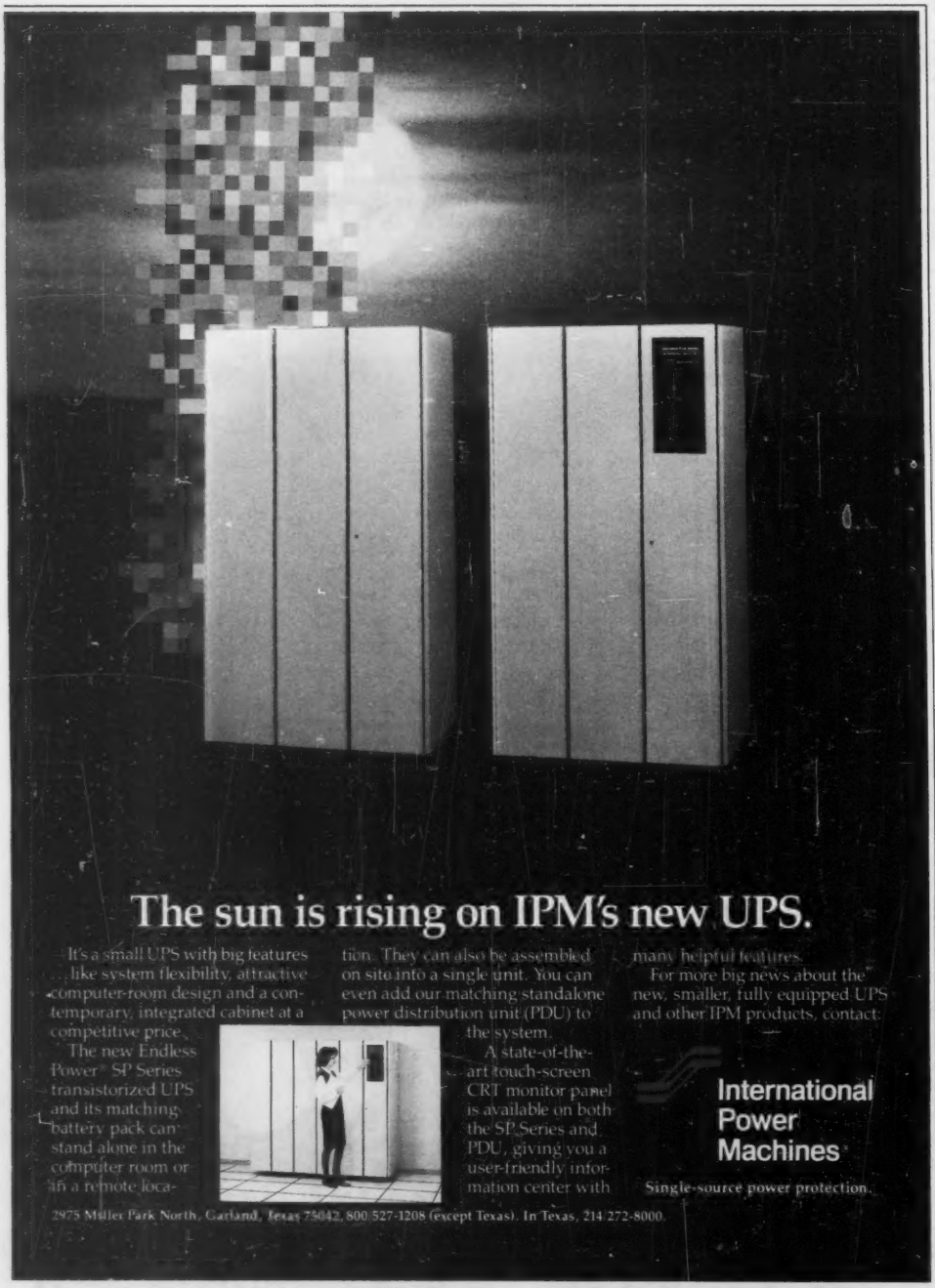
If LANs are to grow into real work group support status, then businesses must begin to take LAN administration seriously. Few businesses would permit a minicomputer to support 100 on-line users without any operations staff, yet these same users will permit LANs twice that size to exist without formal administration. If a LAN is a substitute for walking a disk to the next office, this may be survivable; if the LAN functions as distributed work group support technology, it may not be.

Companies need to appoint a qualified administrator who participates in critical application design decisions, selection of application software, review of proposed configuration changes that might affect the community of users and more. In short, the LAN needs a DP specialist to administer the collective data processing activities it is called on to support.

Perhaps the reason that this almost self-evident conclusion seems to be resisted in practice is that PCs and LANs are seen by end users as a way to wrest control of their destiny away from bureaucratic MIS types. Having deposed one unwanted monarch, these users are reluctant to raise up another.

But ultimately, there is only one choice. OS/2, LAN Manager and Lan Server, database servers, gateways, bridges and other emerging technologies are pulling the LAN away from the transparent and populist piece of wire that so effectively cut back on pedestrian traffic in work groups. To the extent that LANs are substitute DP resources, they must be administered as such.

Nolle is president of CIMI Corp., a communications consulting company based in Haddonfield, N.J.


The sun is rising on IPM's new UPS.
It's a small UPS with big features like system flexibility, attractive computer-room design and a contemporary, integrated cabinet at a competitive price.
The new Endless Power™ SP Series transistorized UPS and its matching battery pack can stand alone in the computer room or in a remote location. They can also be assembled on site into a single unit. You can even add our matching standalone power distribution unit (PDU) to the system.
A state-of-the-art touch-screen CRT monitor panel is available on both the SP Series and PDU, giving you a user-friendly information center with many helpful features.
For more big news about the new, smaller, fully equipped UPS and other IPM products, contact:
International Power Machines
Single-source power protection.
2975 Miller Park North, Garland, Texas 75042, 800/527-1208 (except Texas). In Texas, 214/272-8000.

T1 links

CONTINUED FROM PAGE 37

companies' T1 facilities, the research firm said.

The average amount of traffic generated by companies surveyed consisted of 52% voice, 47% data and 1% video, the study found. Based on user responses, however, Comm/Surv predicted that in two years, voice traffic will make up only 47% of total traffic, while data's share will increase to 51%.

The makeup of data communications traffic will also change over the next two years, the study found. The 1988 survey found that, on average, user traffic was 29% asynchronous, 20% bisynchronous and 44% IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC), with the remainder a variety of data types.

Based on user responses, the study predicted that during the next couple of years, asynchronous traffic will decrease to 27% and bisynchronous to 13%, while SNA/SDLC traffic will account for approximately 50% of the whole.

Product reliability, vendor stability and customer support were the top three criteria that users use in choosing a T1 multiplexer, the study found (see chart page 37).

ANYWHERE YOU WANT.

At 3Com, we can take computers running any or all of the operating systems on this page and combine them into a single, integrated network.

Making incompatibility among operating system software virtually a non-issue.

Be it in workgroup, departmental or enterprise-wide networks.

In fact, we network more types of systems to more types of systems than anyone else.

Because we make more modular networking products than anyone else.

Everything from network operating systems to adapter boards to mainframe connections. Each one built upon a platform of leading industry standards. And each one designed with the flexibility to change as your needs change.

It's also reassuring to know that we offer a variety of comprehensive service and support options.

So take a look at your list of preferred vendors. If 3Com isn't on it, maybe you should call 1-800-NET-3Com, Dept. BF.

After all, you're going to have to draw the line somewhere.

3Com®

We network more types of systems to more types of systems.

NEW PRODUCTS

Local-area networking hardware

Plus Development Corp. has announced an expandable hard-disk subsystem for personal computer local-area networks.

Called **Plus Impulse**, the drive reportedly achieves a 12-msec effective access time and offers the ability to connect up to 32 drives onto a single PC LAN server. The product provides a maximum data-transfer rate of 4M byte/sec., according to the company.

Plus Impulse is priced from $995 to $1,379, depending on drive capacity and components.

Plus Development, 1778 McCarthy Blvd., Milpitas, Calif. 95035. 408-434-6900.

A high-capacity storage server for technical workstation networks has been announced by **Epoch Systems, Inc.**

Said to offer Sun Microsystems, Inc. Network File System compatibility, the **Epoch-1 Infinitestorage Server** combines magnetic and optical disk drives to provide 150G bytes of storage capacity.

The servers are available in three versions and are priced from $95,000 to $450,000 depending on configuration and storage requirements.

Epoch, 313 Boston Post Road W., Marlboro, Mass. 01752. 617-481-3717.

Local-area networking software

Automated Design has announced its **Windows Workstation** family of local-area network utilities for users of Microsoft Corp.'s Windows and LANs.

The software reportedly includes an integrated menu system as well as a network printer and background security control functions.

The system may be purchased modularly or as a package, with prices ranging from $695 to $1,195.

Automated Design, Suite 112, 133 Johnson Ferry, Atlanta, Ga. 30068. 404-988-0969.

E-Soft, Inc. has revised its multiline bulletin-board system and communications handler.

Version 2.1 of **The Bread Board System** (TBBS) reportedly offers multiline operation of up to 16 incoming telephone lines on a single IBM Personal Computer XT, PC AT, Personal System/2 or compatible. According to the vendor, enhancements have been made to the software's menu operations, message bases and file-transfer functions.

TBBS 2.1 costs $895. A single-line version is also available for $299.95.

E-Soft, Suite 2550, 15200 E. Girard Ave., Aurora, Colo. 80014. 303-699-6565.

A software-based network security system that offers boot protection through controlled access to the hard disk has been introduced by **RYBS Electronics, Inc.**

Called **Gatekeeper**, the product runs on all IBM micros and compatibles; it works with IBM's PC-DOS 2.0 through 3.3 and most versions of Microsoft Corp.'s MS-DOS, the vendor said.

Gatekeeper costs $79.

RYBS, 2950 Central Ave., Boulder, Colo. 80301. 303-444-6073.

Links

A communications processor for IBM Systems Network Architecture (SNA) users has been announced by **BBN Communications Corp.**

The **T/100 HEP** is a high-speed, host-end processor that connects SNA hosts and front-end processors to a BBN private-jacket network, the vendor said. The unit reportedly supports SNA connections at speeds up to 256K bit/sec. and is priced from $50,000.

BBN, 150 Cambridge Park Drive, Cambridge, Mass. 02140. 617-873-2683.

3X U.S.A. has announced its **3X-Link16** system, which reportedly connects up to 16 personal computers, laptops and IBM Personal System/2s and offers background sharing of peripherals.

The system consists of software, a parallel-port add-on device and a 12-ft cable, the vendor said; files can be transferred in background mode at $500,000 bit/sec.

The product is priced at $199 for the first two stations and $139 for each additional station.

3X U.S.A., One Executive Drive, Fort Lee, N.J. 07024. 201-592-6874.

A software package that allows IBM Personal Computers, PC XTs, ATs and compatible systems to act as an X.25 bridge between multiple Ethernet local-area networks has been announced by **Emerging Technologies.**

Called **ET/Bridge**, the product reportedly works in conjunction with off-the-shelf communications cards to convert PCs into effective Ethernet X.25 bridge nodes. Each PC is said to be capable of supporting up to 64 remote LANs for an unlimited number of users at speeds up to 64K bit/sec.

Et/Bridge costs $1,095.

Emerging Technologies, P.O. Box 1525, Mineola, N.Y. 11501. 516-742-2375.

Tandy® Computers: The broadest line of PCs in America.
The Tandy 5000 MC
Our most powerful 386™ based computer ...made in America.
The Tandy 5000 MC Professional System is pure performance, from the Intel® 80386 processor operating at 20 MHz to the fast memory with cache controller that provides rapid access to your data.
With the 5000 MC, you have the high-performance platform needed to take full advantage of industry-standard MS-DOS® applications, powerful new MS® OS/2 programs or multiuser SCO™ XENIX® software.
Operating at 20 MHz, the 5000 MC cuts through the big jobs like database management, large spreadsheets and sophisticated graphics. And with its IBM® Micro Channel compatible architecture, the Tandy 5000 MC is the ideal high-end PC workstation.
The system architecture also provides an increase in data-transfer rates when the 5000 MC is configured within a 3Com® workgroup or multiuser environment.
The Tandy 5000 MC is the new alternative in personal computing. From the best-selling family of PC Compatibles in America.
Send me a 1989 RSC-20 computer catalog.
Mail to: Radio Shack, Dept. 89-A-767 300 One Tandy Center, Fort Worth, TX 76102
Name
Company
Address
City State
ZIP Phone
Tandy Computers: Because there is no better value.™
Intel/Reg. TM and 386/TM Intel Corp. IBM/Reg. TM and Micro Channel/TM IBM Corp. MS, MS-DOS and XENIX/Reg. TM Microsoft Corp. SCO/TM The Santa Cruz Operation. 3Com/Reg. TM 3Com Corp.
Radio Shack
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

It's a computer-based contest to win the best and brightest

BY GLENN RIFKIN

"Here, there's no bottom-line measure; we're trying to produce knowledge, not profits."
James Poage
Vice-Provost for Computing
Dartmouth College

Knowledge may not translate easily into dollars and cents, and institutions of higher learning may disdain terms such as competitive advantage, but a bottom line does exist even for those who dwell in ivory towers. And there is an increasing awareness among information systems professionals on America's campuses that the bottom line is dependent on information technology.

"The currency of academia is reputation," says Kenneth King, president of Educom, a consortium of 574 universities that deals with information and technology issues for higher education. In order to attract and retain the best faculty and staff in an ever-shrinking talent pool, universities and colleges are finding that they must offer more than picturesque quadrangles and fully stocked libraries. State-of-the-art computing is becoming a priority requirement for campus America.

Few university information systems executives would argue with the forecast offered by John Sculley, chairman and chief executive officer of Apple Computer, Inc. at a recent meeting of Cause, the professional association for computing and information technology in higher education. "The real structure of universities in the 21st century will not be bricks and mortar," Sculley said. "It will be information systems."

In fact, if anything, some analysts might advance the timetable slightly. King, for example, says he believes that "the effective use of technology will play a major role in a school's ranking in 10 years."

Achieving the levels of technological sophistication that will soon be necessary to keep up — let alone stand out — will not be an easy task for university information systems executives, however. For most, it will mean an ongoing financial and strategic struggle.

Despite the fact that most technological breakthroughs are spawned on campuses, the average institution of higher learning is well behind its corporate cousins in embracing technology.

The average cost of computing as a percentage of total budget in higher education is just 2.5%, which is up just 1% in the last five years, according to King. "Universities are in an information-intensive business and should track the same as the business world," he says. "But universities on average are five years behind in expenditures."

One problem is that colleges and universities, unlike private industry, cannot always easily measure the benefits of technology and factor them into fiscal plans. Both state and private institutions face financial uncertainty in a time when expenditures on technology should be rapidly increasing.

The financial crunch is particularly acute at state schools, which must depend on the largesse of government officials. Says one campus chief information officer, "The university has identified computing as a high-priority item, and the Board of Regents has endorsed it, but as far as the governor and legislature are concerned, that's a long way from being cash."

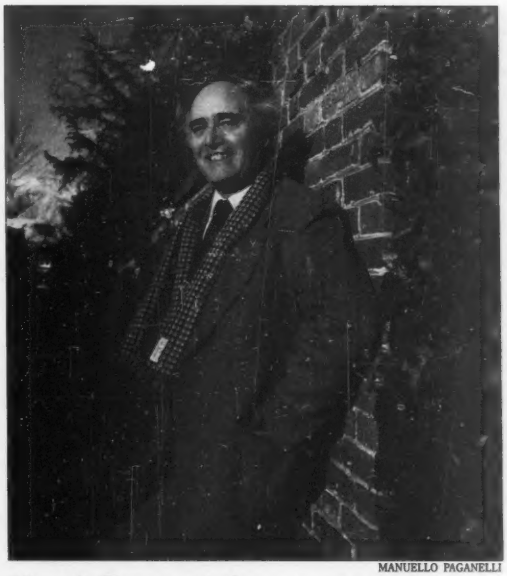
As a result, many schools seek relationships with vendors that can provide equipment grants and discounts. "We're cheap, we're always looking for a handout," says Thomas West, assistant vice-chancellor of computing and communications resources for the California State University system. "I wish it didn't have to be that way."

At many schools, including prestigious research institutions, the proliferation of personal computers and workstations has also produced considerable financial nightmares for traditional centralized computing centers. As computing power has become distributed to individuals and departments, the need to buy time on mainframe cycles has diminished, and computing centers that used to support themselves with the surcharges on time-sharing cycles are in trouble.

"It's a major problem, and budgets are being cut," says King, adding that while computer center budgets are dropping, expectations are rising. Researchers, in particular, are demanding access to national academic networks such as National Science Foundation's NSFnet, which gives them time on one of several supercomputer centers in the country.

And money is not the only problem. Information systems professionals on campus face a host of other challenges when they try to extend the reach of technology. Although these challenges vary dramatically depending on the size and culture and funding status of the institution, there are problems that span the whole range.

For example, the toughest assignment at any institution of higher learning is finding consensus in a world of independent thinkers and autonomous groups. "On campus, no one will stand up and insist on anything," says Robert Street, vice-president for information resources



MANUELLO PAGANELLI

Educom's *King sees computing as a campus cornerstone*

Rifkin is a *Computerworld* senior editor.

INSIDE
Central systems juggle multiple majors
Page 46
Solving campus network conundrums
Page 47

Contest

FROM PREVIOUS PAGE

at Stanford University. "We operate more on the carrot principle than on the stick principle."

Nowhere is the gap in thinking wider than between academic and administrative computing on campus. Not unlike the separation of church and state, these two bastions of campus power have traditionally kept a safe distance from each other. But in the last five years, many campuses have sought to bring the two environments together in hopes of achieving certain economies of scale. Not everyone agrees with the trend, and obstacles continue to plague such a union.

Administrative MIS veterans like Sam Splice, director of telecommunications and administrative systems at the University of Michigan, actively lobby to keep the administrative and academic worlds separate. "Our environment wouldn't work for them, and theirs wouldn't work for us," Splice says. "We'll cooperate where we can."

Illustrating the division between the two sides was the reaction to a proposed merger of Cause (an organization of individuals on the administrative side) and Educom (academic side). At a recent Cause conference in Nashville, Splice, along with a vocal contingent of administrative information systems veterans, worked to keep the two from merging.

"In the academic world," Splice says, "everybody thinks he is a manager. [Academics] want access to everything but they don't want to support the same packages or protocols; they are all over the place."

High expectations

Splice says that academic users want support and response, and they cannot understand when the systems people do not move as quickly as they expect. "Our databases are huge and hierarchical and are tough to navigate through," Splice says. "We try to serve both sides but demands on us have grown as the technology has matured. The question is, Who provides the infrastructure?"

The answer to that question varies from campus to campus. At Stanford, the decision to reunite administrative and academic computing in 1986 has proven to be a critical and financial success, according to Street. "We have a $45 million operation," he says. "With something that big, you can take advantage of the economies of scale."

The university needed an IBM 3090 Model 300 with vector processing to handle its peak computing loads during the day. Street sought to cushion that investment by actively selling time on the free cycles during the evening. He offers these near-supercomputer capabilities for a low rate ($40 per hour) to faculty and students who need the large-scale computing power. The university provides funds for users without external support and charges the research grants of those with support.

Unfortunately, many schools have had less positive experiences.

At the University of Southern California (USC), the academic director of budget planning looked at the numbers involved in supporting three separate groups — academic, adminstrative and scientific and engineering — and decided in 1984 that all computing should be placed in one center. The vice-president of finance, who had contentedly built a financial system around Prime Computer, Inc. equipment, declined to participate. But the IBM group, representing the main computing center, and the Digital Equipment Corp. group, from science and engineering, set out to merge.

According to Dianne Bozler, director of USC Software Systems, it was a mismatch of cultures from the beginning. The director of the IBM installation was put in charge, and although the IBM side was made up of environments such as SAS and SPSS, the systems staff was handpicked from the DEC environment. The DEC people quickly learned the IBM protocols, but that was not enough. "We had a bunch of guys who had come from this exciting DEC environment who were told 'No more hacking. We have paychecks to run,' " Bozler says.

Dartmouth's Poage

For a year, the university stayed the course, bringing in consultants to help facilitate what was turning into a painful marriage. Deadlines were missed, reports were not delivered and service declined across the board. "It simply didn't work," Bozler says. "There was a total inability to understand that you just can't bring a system down in the middle of the day. If they needed to run something, they just brought the system down with no warning at all, and we couldn't stop that behavior."

Decisions as to the coupling or uncoupling of academic and administrative computing continue to be hammered out in large institutions. But that is hardly the only pressing issue.

Organizing strategically to serve the varied constituencies will determine success in a competitive marketplace.

"The problems are not all that different from major corporations, but higher education tends to look within itself rather than to the corporate world for solutions," says R. Schuyler Lesher, a consultant at Nolan, Norton & Co. in Lexington, Mass., who has spent 12 years viewing academia's use of technology.

Lesher reports that often in higher education, strategic planning neglects information technology issues; worse, the plans center around how schools are currently organized rather than how they might be in the future.

Some of the major planning challenges facing information systems on campuses are:

- **Networks.** Networks have become a priority for information systems professionals in higher education. Information access to the larger academic community is becoming a measure of competitive advantage at a school. Researchers and students are now demanding access, but the road to connectivity is filled with potholes.

Laying a network across traditionally hierarchical organizations, not to mention diverse academic and administrative computing environments, is no easy task. Infrastructures must be introduced, and that takes careful strategic planning. "Putting a network on an old hierarchical structure takes some real visionary planning," Lesher explains. "They have to look to new models."

Adding to the confusion is the proliferation of national and international networks that serve academia, such as BITnet and NSFnet.

Richard West, assistant vice-president of information systems and administrative services at The University of California, can attest to just how tricky networking can be. West faces a laundry list of networking issues. He oversees the computing environments for the entire University of California system, which encompasses nine campuses. He recognizes that each campus must have autonomy, but a strategic direction is critical if all of the campuses are to benefit from information technology.

This is no easy task since there are 15 major computing centers on the campuses and 14 have standardized IBM MVS environments for administrative computing. On the academic side, computing evolved on a peer-to-peer basis, and thus Transmission Control Protocol/Internet Protocol (TCP/IP) became a de facto standard. TCP/IP-based networks are fine for certain needs, Richard West says, but there is no central network management, and therefore, no one knows if the network is working. The University of California, Los Angeles is currently working with IBM to support the interoperability of TCP/IP and IBM's Systems Network Architecture.

- **Keeping abreast of new technology.** Without deep pockets to fund infusions of new equipment, many schools struggle with outdated systems. Hooking new technology, such as workstations, into these patchwork quilts of homegrown code and cut-and-paste networks is no simple task. And just when computing center managers thought they had a handle on PCs, Steve Jobs unveiled his Next, Inc. machine and targeted it squarely at the university market (see story page 47).

"The campus grows obsolete at a frightening rate," Dartmouth's Poage says. "This year's seniors will graduate with 128K-byte Macintoshes, which are now just boat anchors. How do you keep the faculty and staff up to date with what the freshmen have?"

Old-line DP types who have been shifted into strategic MIS positions must be ready to oversee and lead that new wave or risk getting swamped by it. Are they up to handling it? "No," says California State University's Tom West. "The Peter Principle is definitely at work. Out of 19 campuses in our system, we've seen an information systems leadership change on 12 of them in the last five years."

- **Security.** Computer viruses tend to strike first on campus, particularly at high-tech-oriented schools such as MIT or the University of California, Berkeley. Widespread use of Unix makes a rampaging virus significantly more dangerous. Information systems managers on campus are less concerned about hackers, however than the potential threat to data integrity inherent in opening databases to the end users sitting at PCs and workstations around campus. "There's no reason not to give students access to grades and registration material, but we're holding up on that because we're afraid to let students into the databases," University of Michigan's Splice says.
- **Library automation.** Universities and colleges are scrambling to get their libraries on-line and automated, but millions of volumes, reports and other printed material make this a costly and time-consuming task.

At Dartmouth, the library was the first entity to get involved with computers, according to Margaret Otto, Dartmouth's head librarian. And, she claims, Dartmouth was among the first to get its card catalog on-line and to develop a computer-based acquisition and control system.

Still, even with an early lead, keeping up with demand is a challenge. Faculty and students now expect 24-hour access

A tradition of technology

At Dartmouth College, a small liberal arts school in the snowy hinterlands of New Hampshire, technology is part of tradition. This harmonious situation exists largely due to the influence of John Kemeny and Tom Kurtz, who created the Basic language there in 1965 and initiated a campus-wide time-sharing network.

Since then, the college's centralized computing operation, organized around the Kiewit Computation Center, has spearheaded a major commitment to computing.

Today, there are more than 6,000 Apple Macintoshes on campus (with just 5,000 students), and 85% of all students will purchase a computer during their undergraduate careers.

And though it is relatively small in size, Dartmouth has big plans. The college and its library have initiated an integrated information retrieval system called Dartmouth College Information System (DCIS), while the Thayer School of Engineering there has embarked on Project Northstar, an ambitious multiphase development plan.

DCIS will combine a user-friendly windowed interface on the Mac, the high-speed Kiewit campus network and a variety of databases that will give campus users access to new and better educational tools. Eventually, DCIS will provide the ability to combine numerical, textual and compound documents, as well as video and audio.

The goal of Project Northstar, which started in 1986, is the development of computerized curriculum materials and the construction of a communications network to deliver programs to faculty and students.

According to Dan Lynch, associate dean of Thayer and principal researcher on the project, Northstar will eventually incorporate 400 high-powered Unix-based workstations.

Even Dartmouth's exceptionally receptive computing atmosphere is not immune to conflicts, however. Because Dartmouth's scientific/engineering program is relatively small, Northstar fights an inherent prejudice against the value of Unix. With Macintoshes everywhere on campus, it has become a political battle to get support for the minority operating system.

GLENN RIFKIN

to libraries from their workstations, and as disk storage technology improves, full-text availability will become a must. "The library building may become obsolete down the line," Otto says.

• **Impact on education.** Finally, perhaps the most crucial planning question concerns what impact computing will have on the actual learning process. Although most undergraduates are computer literate, and the PC is common enough to be considered part of the furniture, its impact on learning remains unclear.

John Kemeny, former Dartmouth president and creator of the Basic language, says he believes that the computer is an expository tool but that it does not necessarily change what is learned. Lawrence Levine, director of user services at Dartmouth, claims the computer is just one small factor in a student's life and it is difficult to separate out just what it does for the learning process. "Students have access to more information, but do they write better papers? No, they write longer papers, which are easier to read."

"We'd like to see computing affect the entire course curriculum," says Stanford's Street. It hasn't happened yet, he says, "but we think it will."

Ironically, the most financially secure institutions are not necessarily at the forefront of technology.

"I've seen as much reluctance to make changes at schools with money as at schools without money," Lesher says. "I've seen some real innovation at small schools which have taken advantage of commercial software packages out there. Smaller schools often don't have the burden of a huge infrastructure that has to be changed or gotten rid of."

Keeping up with the Joneses

In fact, size of the institution does not alleviate the concern that some of the most technologically impoverished departments can be found side by side with the most heavily endowed.

"There is definitely a battle between the haves and have-nots," University of California's Richard West reports. "Faculty members in electrical engineering and computer science don't have enough space to put in all the machines vendors give them, while the art historian has to beg for a PC. There is definitely tension."

In the long run, Richard West says that these arguments will become moot. "We've got to start viewing computing as part of the university infrastructure just like the library, offices, desks and telephones," he states. "The cost of recruiting the top students and faculty is going up. Prospective faculty now ask, 'Do I get a workstation? Do I get supercomputing time? Am I on the national network? Is there staff to write software for my course?' We haven't made the commitment yet, but it's becoming a priority." •

Rehearsing on a small screen

BY SHARON BAKER

Students of the performing arts will soon have a new medium on which to fine-tune their productions.

The Creation Station, a software program designed to run on Next, Inc.'s Next machine, will help these artists-in-training generate, edit and produce a play, dance or video on computer.

David Gregory

The software was designed by David Gregory, director of the Center for Performing Arts and Technology at the University of Michigan in Ann Arbor, along with colleagues Hal Brokaw and Henry Flurry. The program gives students more hands-on exposure to fine arts.

Gregory envisions universities setting up Creation Stations in individual rooms, much like practice rooms in a music department, in which both students and faculty can conduct individual work on their own time.

"The bottom line is that creative artists are going to have a really potent tool for either creating things or for simulating things," Gregory says.

The Creation Station permits the manipulation and integration of animation and music. A choreography student, for example, can create a floor pattern by moving a three-dimensional representation of a dancer across the screen with a mouse, terminating the action by clicking the stop button. He can then create two more patterns on two separate tracks. A simple touch of the play button will allow the student to simultaneously review the three steps he just established.

Once the steps are choreographed to the student's liking, music can then be added to another track, and the multimedia performance can be played back to see how the dancers relate to the music before rehearsals take place.

The system, expected to become available in the second quarter of 1989, was demonstrated at the recent Educom conference held in Washington, D.C.

Baker is a *Computerworld* assistant editor, features.

Animating the classics

BY BONNIE MACKEIL

A group of professors from Boston University, Harvard University, Bowdoin College and Pomona College are working to breathe life into the study of classical Greek civilization. The means for this effort is Perseus, a software program now being tested in classes at Harvard and Bowdoin. The program is scheduled for completion in December.

The program, which has been in development since July 1987, is set up as a hypermedia database using Apple's Hypercard. According to Greg Crane, director of the Perseus project, the system gives students a more vivid view of this ancient and complex period. "We're trying to tie together as many different kinds of information about a rather messy subject [the reconstruction of the world] and tackle it as fluidly as possible," Crane says.

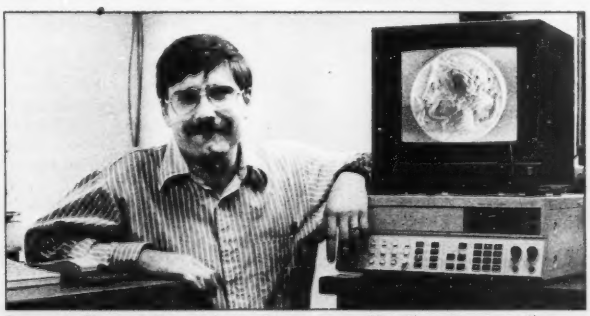
Using Perseus, he explains, students are able to call up a map of Greece, point to a section of the country and view a map of that area. By clicking on a specific city within that area, they can get more detailed information, such as the presence of artifacts and ruins. If they need more information, they can call up articles about the subject.

The program also enhances the study of Greek literature. When reading a play, for example, a student can re-create the staging, positioning the actors on the screen and trying out entrance and exit possibilities. This level of visualization changes the way students think about the text, Crane says, and gives it an immediacy that it never had before.

According to Crane, students learn more in less time using Perseus, and they get more excited about their work because the payoff for their time investment is bigger.

"They are able to learn things that even professional scholars weren't able to learn before," he adds.

MacKeil is a *Computerworld* researcher.



Perseus director Crane *hopes the program will enliven Greek studies*

DB2 Concepts & Facilities

Announcing a one-day presentation for professionals at all levels at just $100 per person.

Franz Schneider, Principal Consultant with Atre/Computer Assistance.

Franz Schneider conducts seminars and courses on Data Base Management Systems for corporate, academic and government clients all over the world.

Locations & Dates:

Boston	Jan. 31, 1989	Houston	Feb. 15, 1989
Hartford	Feb. 1, 1989	Tulsa	Feb. 16, 1989
New York	Feb. 2, 1989	San Francisco	Feb. 20, 1989
Philadelphia	Feb. 3, 1989	Los Angeles	Feb. 21, 1989
Chicago	Feb. 13, 1989	Denver	Feb. 22, 1989
Dallas	Feb. 14, 1989		

For registration or more information call (914) 967-2037.
Or call your local Computer Assistance representative.

Atre/Computer Assistance
16 Elm Place, P.O. Box 727, Rye, NY 10580

No rest in administration

BY PATRICIA CINELLI

More and more demands are being placed on administrative computing services at colleges and universities. According to Carol Barone, vice-president of information systems and computing at Syracuse University in Syracuse, N.Y., working in administrative systems now means constantly learning new ways of doing things in jobs that will not remain static.

Universities have always been complex organizations, but they have never been forced to work quite as hard at management as they now must do in order to contend with mounting competition for quality students and faculty, financial pressures and escalating requirements for accountability.

Cinelli is a free-lance writer based in Washington, D.C.

For all of those reasons, notes Joe Wyatt, chancellor of Vanderbilt University in Nashville, colleges and universities are increasingly dependent "on the prompt availability of critical information in a form usable by decision makers at various levels in the organization."

In many cases, prompt availability of information is synonymous with direct access. Barone says that demand is rising on her campus for products that allow personal computer users to manipulate data on a mainframe. "Our clients want information faster and want to do more with it," she says. "They want to analyze it themselves so they can make better decisions."

What that means, however, is a much heavier responsibility for the information systems organization in terms of both support and guardianship.

At Syracuse, the support aspect has been handled, in part, through the reassignment of staff from applications groups to administrative support groups that provide services to staff and faculty.

Safeguarding systems integrity in the more open environment is a more difficult problem. "Fifteen years ago, a system assumed a certain ethical standard. Now, security has to be built into applications," Barone says. "In the past, we had supervisors authorize access to records by hand. Now, [user demand dictates that] we have an automated security system that checks individuals against authorization records. With end-user computing, it becomes important to provide access based on the individual's need to know."

And it is not only faculty and staff that are stepping up the pressure on administrative systems. Government reporting requirements are placing greater demands on administrative computing, particularly in the area of financial aid.

At the University of Maryland in College Park, for example, Butch Reinke, director of the administrative computer center, says the amount of data the university's financial aid officers are asked to collect on each applicant for financial aid has almost quadrupled this year.

Syracuse's Baron

Another finance-related area is adding to the systems work load. Fund-raising efforts at many colleges and universities have taken on a new urgency of late, and that means more dependence on information systems.

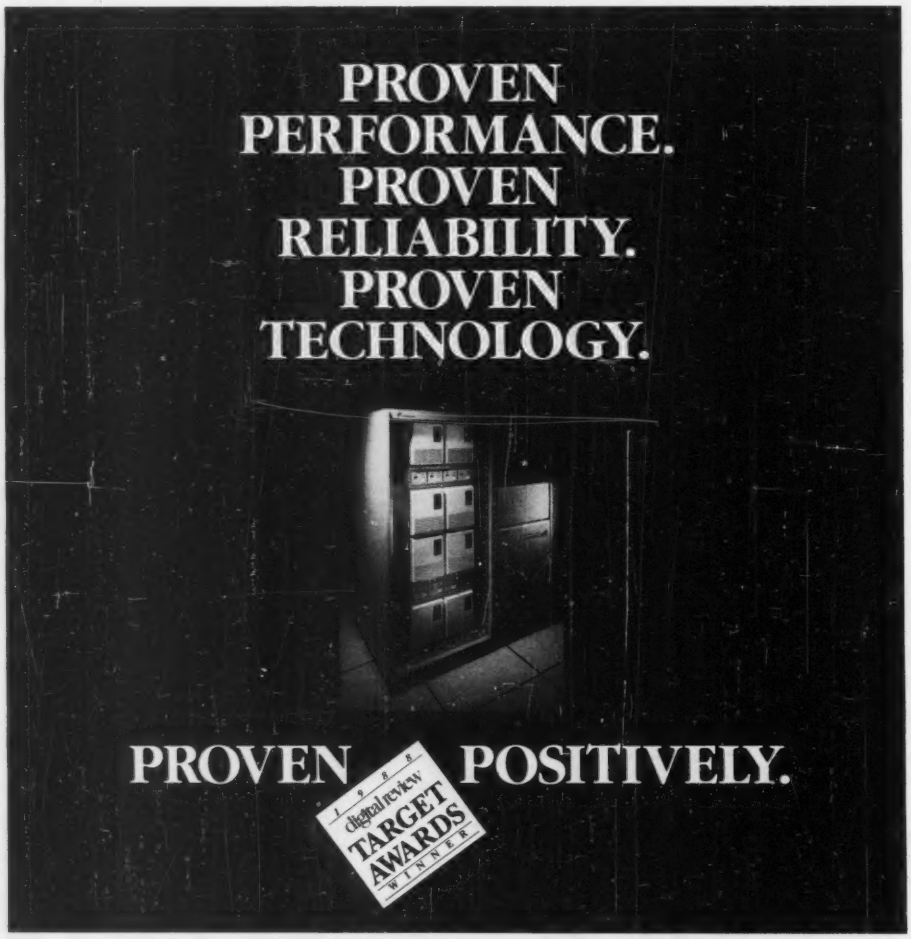
According to Kenneth Pollack, vice-president of information resource management at Wright State University in Dayton, Ohio, college administrators are constantly asking, " 'Who is our audience? How [can we] put together a consistent consolidated approach to raising capital, keeping track of donors and alumni, distributing correspondence and following up?' To effectively perform these tasks, you really need the support of flexible computer programs," he says.

Washington, D.C.-based Gallaudet University, a small liberal arts institution with about 2,000 students and 2,000 faculty and staff, recently began using PCs and modems to contact its hearing-impaired alumni and potential donors on telecommunications devices for the deaf (TDDs). These messages previously had to be manually typed on TDDs for each call. Kevin Casey, director of computer services, says easing the contact process decreased phone time and enabled development personnel to increase the number of donor contacts made in a campaign.

Just making the contact, however, is only part of the job. At Wright State, the kinds of questions that potential donors raise when they are contacted helped to suggest yet another new activity for the systems department.

At Wright, computers are now helping the university conduct institutional research that it hopes will provide answers not only for curious potential donors but also for others with questions, including government officials, administrators, parents and faculty.

Recruitment is another area of systems demand that keeps evolving, according to Pollack. In fact, the phrase now used at Wright State is "enrollment management," which sums up the more sophisticated approach being pursued in prospect identification. The prevailing philosophy is that keeping students is at least as important as attracting them. •



Award-winning Design
It's no surprise that System Industries SI93 C-Series disk drive was the overwhelming choice of thousands of *Digital Review* readers who compared the quality, performance and reliability of half a dozen products in the disk storage category.

100% DSA Compatible
Compare it for yourself and you'll see that our award-winning SI93C is smaller. More powerful. More reliable. And much less expensive than comparable capacity drives.

This high speed Winchester drive offers 50,000 hours MTBF, 15ms average seek time and 23ms average access time. And it's 100% compatible with all DEC DSA controllers.

Special Offer
When you buy a subsystem with four SI93C disk drives by March 15, you'll get a priority delivery position on any of our HSC-compatible tape products, plus a 10% discount on the tape. Delivery on the HSC tape products must be taken by July 22, 1989.

For more information on System Industries SI93C and our complete line of integrated storage subsystems, write or call us toll free for the number of the System Industries Sales Office nearest you, and remember to ask your System Industries sales representative about our other disk and tape special offers.

1-800-333-2220

System Industries
560 Cottonwood Drive
Milpitas, CA 95035

Satisfying both technology- and solution-oriented users

BY STEWART H. ROBINOVITZ

It is not uncommon for designers of campus networks to feel pulled in two different directions. This is because most colleges and universities house two distinct and different sets of users with sharply divergent network requirements and support expectations.

One set, those interested in technology for its own sake, demands state-of-the-art tools. They know what they want and prefer to find their own mix.

The hardware platforms that these technology-oriented users utilize generally include Sun Microsystems, Inc. workstations, Apollo Computer, Inc. equipment, Digital Equipment Corp. Microvaxes, IBM Personal Computer RTs and Apple Computer, Inc. Macintoshes. Unix is their operating system of choice except for the Macintosh, which still requires Apple's proprietary operating environment. Networking is done via the Transmission Control Protocol/Internet Protocol suite.

The only intervention this group usually wants from the central support organization is assistance in campus-wide quantity discounts or site licenses and provision of campus-wide network backbones interconnected to the external world.

> IT IS difficult, if not impossible, to find uniform integrated systems that satisfy both groups.

At the other end of the spectrum are users who view technology as a means to an end. They want systems that are easy to use, along with full support services. These solution-oriented users are pragmatic in their approach, although not necessarily unsophisticated. The often-referenced personal computer power users fit into this group just as well as low-level users. These users emphasize packaging and expect universal answers to all their needs within a strict budget.

This group's platform choices tend to be IBM Personal Computer ATs and Personal System/2s or clones and Macintoshes, and these users prefer networks that do not alter the operating "feel" to which they have become accustomed.

It is difficult, if not impossible, to find uniform integrated systems that will satisfy both groups. But the two populations often overlap in terms of geography and work, so the network designer must create structures that suit separate interests but are also compatible enough to permit communication between both sets.

At the University of Michigan, we currently have Banyan Systems, Inc.'s Virtual Networking Software, or Vines, as the PC local-area network of choice and Apple's Appletalk as the preferred Macintosh LAN for our solution-oriented users. We offer full support and training, detailed network configuration and assistance in network installation.

We also offer a limited amount of support and some informal training for 3Com Corp.'s 3+. We are currently reviewing Novell, Inc.'s status, with the hopes of offering full Netware support.

We recently installed twisted-pair wire within our campus for data and voice and tried to minimize the need for more extensive specialized wire. As part of our efforts to explore this media, we have been working with Northern Telecom, Inc.'s Lanstar high-speed packet transport. We have found the Lanstar to be a good transport for users of Vines and Netware as well as Macintosh IIs. We now support it for those users when there is a great enough concentration to make it cost-effective. Farallon Computing, Inc.'s Phonenet is supported for all Macintoshes. Ethernet and token-rings are occasionally used. The solution-oriented users generally accept whichever of these strategies is most cost-effective.

The technology-oriented users generally prefer Ethernet, so we also have extensive Ethernet. The Lanstar tends to be rejected by these users, partially because it is proprietary but mostly because it will not support Ethernet-equipped workstations, and many advanced-function workstations come with integrated Ethernet adapters.

The technology-based users do not want as extensive an effort made for them as do the solution-based users. The university has been trying to set up a structure to support these users. There are major groups supporting advanced-function workstations and high-speed networking and projects with major vendors, including IBM and MCI Communications Corp.

These projects have been undertaken by the information technology division to place the university on the technological frontier. The Center for Information Technology has also been established to facilitate these efforts.

The Institutional File Server is a joint project with IBM to develop a facility in which large IBM mainframes can be used as secure, central and distributed file servers in a multivendor academic environment.

The project will also build in file access work that is being developed at Carnegie-Mellon University. It will provide services in a Unix environment using Sun's NFS and for Macintosh using Apple's AFP protocols, so that Unix and Macintosh users will access the network in a consistent manner.

The campus fiber backbone uses fiber optics and cable provided by Northern Telecom. Its goal is to create a high-speed network using the emerging Fiber Distributed Data Interface (FDDI) protocol. We are working with several vendors with the objective of providing the first large operational multivendor FDDI network.

One of our biggest challenges is taking the results of these projects, which appeal greatly to the technology users, and ensuring that they are of use to the solution users. •

Robinovitz is a telecommunications specialist at the University of Michigan's Office of Administrative Systems and Center for Information Technology Integration.

Next in line on campus?

Steve Jobs says his new machine will "revolutionize" higher education. Such words tend to provoke skepticism among academics who have heard many promises. But campus MIS professionals are not dismissing Jobs or his new product by any means.

Jobs, after all, delivered the Macintosh just before he left Apple Computer, Inc.

The Next machine also has credentials that are hard to ignore. Beyond its sleek magnesium package and stylish 17-in. black-and-white high-resolution monitor, the machine, which has been priced at $6,500, offers the high-powered Motorola, Inc. 68030 microprocessor. It incorporates stereo compact disk sound as well as a breakthrough magneto-optical disk drive that stores 256M bytes of material.

The Next operating system is a version of Unix called Mach, which Dan'l Lewin, Next's vice-president of marketing, says provides a critical advantage — the possibility of interapplication communications. Nextstep, its software development environment, is an object-oriented mechanism that Lewin says could bring object-oriented programming out of the laboratory and into the classroom.

Still, not everyone is convinced that Next will take campuses by storm. Industry leaders such as Bill Gates of Microsoft Corp. and Bill Joy of Sun Microsystems, Inc. have been widely quoted as saying that they are not overly impressed by the machine. And at the recent Cause meeting in Nashville, John Sculley, president of Apple, the firm likely to be most affected by Next, was more than a bit skeptical.

"I have a tremendous respect for Steve's passion for education," Sculley said of his former boss. "But there wasn't anything surprising in the Next announcement. There isn't anything there that Apple won't be able to offer."

Nothing has raised more doubts and questions for Next than the machine's announced cost. The $6,500 price tag is either considered too high or too low, depending on your point of view. Robert Street, vice-president for information systems at Stanford University, is in the first camp. "It won't be bought by large numbers of students; $2,500 is about as high as students will go," he says.

Sculley, on the other hand, questions whether Next can deliver all that it claims for $6,500. "Let's just wait and see what people end up paying," he says.

Lewin bristles at the price questions. He claims that Next will find a lucrative niche between personal computers and high-powered workstations and that $6,500 is not too high for the package the user will get.

Time may be Next's greatest ally. Price aside, Street likes what Next is doing: "I'd be startled if in five years it didn't have a major impact on campus."

GLENN RIFKIN

IBM in the '90s

Announcing a free one-day seminar presented by Shaku Atre.

Shaku Atre

Computer Assistance, Inc., a leading professional services firm specializing in Data Base consulting and education, presents *Shaku Atre*, an internationally known consultant and lecturer, for discussion on "IBM IN THE '90s".

Locations & Dates:

Wellesley	February 28, 1989
Hartford	March 2, 1989
Chicago	March 7, 1989
New Jersey	March 9, 1989
Dallas	March 28, 1989
Los Angeles	March 30, 1989

For registration or more information call (914) 967-2037.
Or call your local Computer Assistance representative.

Atre/Computer Assistance
16 Elm Place, P.O. Box 727, Rye, NY 10580

THERE ARE NO MORE ISLANDS.

Announcing a data networking breakthrough. Northern Telecom introduces the new corporate-wide Meridian Data Networking System.

At last you can bridge the gaps of distance, time and incompatibility—to harness the full power of your data resources.

The Meridian Data Networking System is a breakthrough approach to connecting a company's computers and terminals into one high-value network.

And it's already at work at several corporations recognized for their leadership in data networks.

Now information is easy to reach. To find the application you want, simply select it by name from a menu. Meridian DNS knows where and on what kind of computer the application is stored, how to reach it, and how to make it compatible with your terminal or PC.

Free to move information easily, you can create powerful new services never possible with your existing isolated networks. Meridian DNS lets you expand your electronic mail system throughout your company. Or extend a local area network across the country. Or access files regardless of their geographic location.

Finally, you can adapt your network to the needs of your business, instead of the other way around. Because even as the Meridian Data Networking System increases the flow of information, it reduces the cost and complexity of moving it.

Powerful management tools and a consistent, friendly man-machine interface make monitoring and controlling the network more efficient than ever. And by supporting important computing and communications standards such as SNA and OSI, it preserves your current investment in equipment and applications.

Start by linking your IBM SNA network and PC LANs today, and you're on the way to linking all your data resources—from one end of your company to the other.

We put all our digital telecommunications networking expertise behind breaking the corporate-wide data networking barrier. We're a leader in building the largest, most cost-effective and open networks ever devised. We've made them easy to use, powerful enough to connect you reliably to almost anywhere, and manageable. Everything you've wanted in your data network, but could never have.

The Meridian Data Networking System does more than open up your information system. It opens up new opportunities for your business because it gives you a competitive advantage.

Without it, you might as well be stranded on an island.

Call us at 1-800-543-9806.

NORTHERN TELECOM

THE POWER BEHIND NETWORKING™

Cut database development costs.

Special offer. SQL development system only $395.

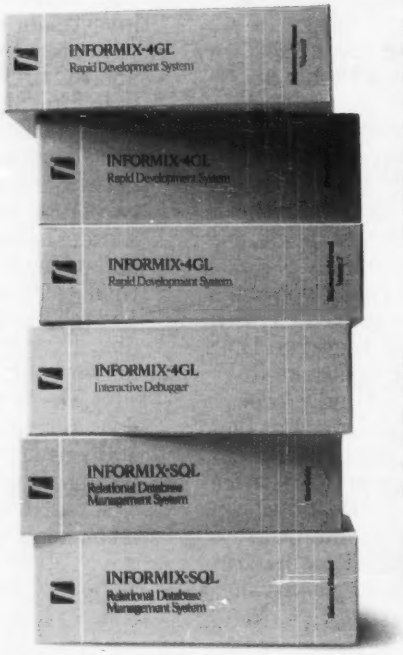
Seldom has so much been available for so little.

Introducing the SQL Developer Series from Informix. Which consists of, take a deep breath, the MS-DOS version of INFORMIX-4GL RDS/ID (our powerful INFORMIX-4GL Rapid Development System and Interactive Debugger) plus INFORMIX-SQL (our best-selling relational database management system).

And for a limited time, you can get all that software (a $2290 value) for only $395.* We'll even provide an optional 6-month maintenance contract for $250.

Develop in DOS. Port to large systems.

Better yet, the software is as special as the offer. You see, the SQL Developer Series lets you quickly and easily develop, debug and compile your SQL application in DOS (without 640K memory restrictions).** And because the application you develop is in p-code, it's directly portable to UNIX, XENIX or networked DOS, without rewriting or recompiling.***



Clip this ad to cut your costs.

Simply put, the SQL Developer Series is the most productive, least expensive way to build SQL applications. So order yours today. Fill out the coupon portion of this ad and send it to the address below. Or call (415) 322-4100.

INFORMIX

#1 for good reason.

_____ Please send the SQL Developer Series for $395 (shipping included). _____ 3½" diskettes _____ 5¼" diskettes
_____ I'd also like the 6-month maintenance contract for $250.

Name _____ Title _____ User or VAR? _____

Company _____ Address _____

City _____ State _____ Zip _____ Phone _____

Requirements: IBM® PC, PC/XT,™ PC-AT,™ PS/2 Series or 100% compatible, DOS 3.1, 3.2, 3.3, 640K RAM. Note: extended memory supported, but not required.

Method of payment. Circle one. Check M/C VISA AMEX

Card No. _____ Exp. Date _____ Signature _____

Mail to Informix Software, Inc., Dept. DP88, 4100 Bohannon Drive, Menlo Park, CA 94025. Prices in U.S. currency.

*Offer expires February 28, 1989. Ask us about run-time licenses for UNIX, XENIX and networked DOS systems. **Up to 16MB memory supported if available.
***Obviously, mixed 4GL/C programs or code written to take advantage of specific operating system features may need to be rewritten or recompiled.

Informix is a registered trademark of Informix Software, Inc. All other names indicated by ® or ™ are trademarks or tradenames of their respective manufacturers.
© 1988, Informix Software, Inc.

A directory of 1988 feature articles

Computerworld presented a variety of regular and special features throughout 1988, covering a wide range of managerial and technical topics.

In Depth offered 66 stories, written predominantly by industry experts and treating such subjects as benchmarking, executive support systems, Unix vs. Systems Application Architecture, Integrated Services Digital Network (ISDN) and quantum computing. Several In Depth stories were written by CW news staff members, including three profiles of leading-edge MIS organizations: Du Pont Co., J. C. Penney Co. and American Express Co. In November, our microcomputer reporting team scoped out MIS' personal computing options for 1989.

Product Spotlight analyzed 21 product categories in the buyer's guide section. The areas covered ranged from database management systems to IBM's Systems Network Architecture market to PC graphics.

In 1988, Executive Report examined 19 issues of particular relevance to MIS management, targeting seven vertical markets — health care, airlines, manufacturing, education, banking, government and retail — as well as large networks and PC networks, Transmission Control Protocol/Internet Protocol, ISDN, the Bell operating companies and systems integration.

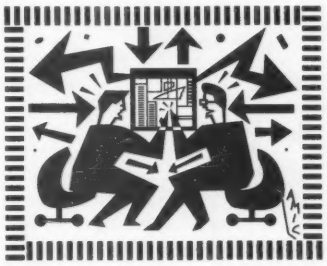
Computerworld Focus presented 11 issues last year, specifically covering different aspects of communications/connectivity, software, departmental computing, security and personal computing.

The 13 special features offered by CW in '88 included the first annual Premier 100, three *Computerworld Extras*, the annual salary and job satisfaction surveys and hardware roundups. Reports on PC buying, the corporate Macintosh and computer careers for graduates rounded out the specials lineup.

In 1988, 16 section features were presented, primarily covering management topics.

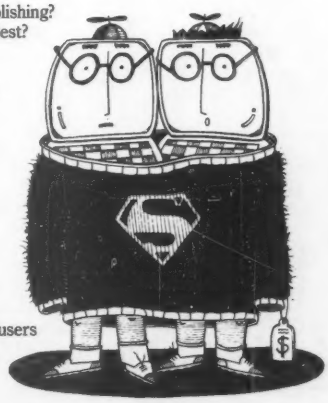
This index will help readers locate articles that were published in *Computerworld* in 1988. To order a back issue, call or write the Back Issues Department, P.O. Box 9171, Framingham, Mass. 01701-9171, 508-879-0700, ext. 371. The fee is $2 per issue plus $1 postage and handling, prepaid by check to *Computerworld*. Please note that issues published on Jan. 4, Jan. 25, April 25 and July 18 are no longer available.

For multiple reprints of individual articles, call or write to the Rights and Permissions Department at the above address and phone number, ext. 304. Reprints are available on 8½- by 11-in. paper in quantities of 100 or more.



IN DEPTHS

Jan. 11		A directory of 1987 feature articles
	Alan Radding	Micro mismanagement
Jan. 18	*James Schweitzer*	Tangible losses
Jan. 25	*Conrad Blickenstorfer* (pro), *John Xenakis* (con)	Why the Mac will win
Feb. 1	*Roger Philips*	Productivity tools sit idle
Feb. 8	*Martin Goetz* (no), *Peter Schneider* (yes)	Object-code only: Is IBM playing fair?
Feb. 15	*Mickey Williamson*	Neural networks: Glamour and glitches
Feb. 22	*Philip Gill*	MIS slowly warms up to object-oriented programming
Feb. 29	*Mary Lou Jordan*	Executive information systems make life easy for the lucky few
	John Rockart, David DeLong	ESS shakes up the system (from *Executive Support Systems*)
March 7	*Alan Radding*	IBM PC orphans hang onto a good thing
March 14	*Kelly Shea*	An interview with Patricia Seybold: Work group computing supports people, not applications
March 21	*Michael Sullivan-Trainor*	Not just another end-user liaison
March 28	*Marguerite Zientara*	A lender, a vendor and a micro defender (from *Women, Technology and Power*)
April 4	*Brett Middleton*	Programmers: *Not* a breed apart
April 11	*Michael Packer, Janice Brodman*	A competitive strategy for the rest of us
April 18	*G. Berton Latamore*	Your choice: Public or private electronic mail
	Alan Radding	Interview: Andrew Singer of Think Technologies
	Henry Eric Firdman	Expert systems: Are you already behind?
April 25	*Fred Viskovich*	From anarchy to architecture
May 2	*Alan Radding*	Who should spearhead corporate electronic publishing?
May 9	*William Inmon*	Rating the vendors: Whose DBMS runs the fastest?
May 16	*Daniel Lalonde, A. Duane Donnelly*	Voice technology speaks for itself
	Amy Fiore	Interview: Bob Steingart of Kurzweil
	Mark Duncan	A simple barometer forecasts software trouble
May 23	*Clinton Wilder, Nell Margolis*	Du Pont: Information on a global scale
	Steve Ulfelder	Taming of the techie
May 30	*Edward Tenner*	Bad news for trees
	Alan Radding	Users can't escape paper
June 6	*Michael Finneran*	ISDN: What's here now
June 13	*Jon Roland* (con), *Richard Finkelstein* (pro)	SQL: Bane or boon?
June 20	*Alan Alper, James Daly*	J. C. Penney cashes in on leading edge
	Sharon Baker	Manhattan-worn Penney heads west
	Tony Percy	What CASE can't do yet
June 27	*Alan Radding*	PC productivity labeled "good enough" by end users
July 4	*Kathleen Potosnak*	Does your software thwart end users?
July 11	*Ken Sloan*	All your assets on-line
July 18	*Dan Woods*	Living in two worlds: A programmer's lament
July 25	*Dan Nolan*	Bad language (on the need for articulate programmers)



Aug. 1	*Tom Sawyer*	Benchmark sleight of hand
Aug. 8	*Mark Teagan, Liz Young*	The dynamics of prototyping
Aug. 15	*Alan Radding*	Two-for-one sale (on minisupercomputers)
Aug. 22	*Curt Hartog, Robert Klepper*	Business squeeze pushes software sales up 184%
Aug. 29	*John Leber*	Application or misapplication? (on misapplying PC software)
Sept. 5	*Fred L. Forman, Milton S. Hess, Michael S. Cohn*	Form precedes function: A design-first plan to systems development
Sept. 12	*George Schussel*	Hey, can't you read design?
Sept. 19	*Jon Roland*	Unix vs. SAA
Sept. 26	*Dien Phan, Douglas Vogel and Jay Nunamaker*	Molecular machines: Tiny computers based on nanotechnology The search for perfect project management
Oct. 3	*Glenn Rifkin, George Harrar, Harry Andersen*	How DEC passed up the PC boom (from *The Ultimate Entrepreneur*)
Oct. 10	*Lee Gruenfeld*	When your top execs want sales and cost data — fast
Oct. 17	*Asher Yuval*	The quantum computer: It's so fast, it finishes executing an instruction as soon as it starts
Oct. 24	*Bob Stahl*	When the symptoms of software engineering troubles get more attention than the problems do
Oct. 31	*Larry Harris*	The ins and outs of software testing When bigger AI isn't better
Nov. 7	*Capers Jones, Robert L. Glass*	Using Function Points, MIS can measure the power of its programming languages Software design: It's all in your mind
Nov. 14	*CW Staff, David Baer*	Scoping out the PC options in 1989 Distributing functionality to workstations is nice in theory, but it may be out of reach for now
Nov. 21	*Janet Ruhl*	A misrepresented job can lead to programmer dissatisfaction — and turnover
Nov. 28	*Frank Sweet*	With the advent of distributed processing, smaller DBMSs may take the helm from DB2
Dec. 5	*Irv Brownstein*	Is your PC software running wild?
Dec. 12	*James Connolly, Elisabeth Horwitt*	American Express sets own limits
Dec. 19	*Jessica Keyes*	NYSE creates expert system prototype as financial analyst aid

SPECIAL FEATURES

Jan. 4	Forecast '88	
May 9	Special Report	On the fast track to smart PC buys
June 20	*Extra*	Productivity
Aug. 8	Special Report	Macs on Main Street: Are they making it?
Sept. 5	Salary survey	For MIS, the big payoff is in utilities
Sept. 12	Job satisfaction survey	MIS pros a restless but happy crew
Sept. 12	Premier 100	The companies investing most effectively in information systems
Sept. 19	Hardware roundup	Large and medium-scale systems
Oct. 3	Hardware roundup	PCs, workstations and small systems
Oct. 17	*Extra* on DEC	DEC readies for the '90s
Oct. 28	College special	Campus edition: Computer careers
Nov. 14	*Extra* on IBM	Can George Conrades keep IBM's promises?
Dec. 26	Forecast '89	

COMPUTERWORLD FOCUS

Jan. 6	Communications as a business ally: Solutions for the savvy manager
Feb. 3	Taming the software beast: How to gain an applications advantage
March 2	Mid-tier might: Departmental computing redefined
April 6	Out of harm's way: Security planning can save your business
May 4	Getting the message across: Connectivity on a grand scale
June 1	The discovery years: Learning the power of the PC
July 6	Software to the rescue: Leading business to better performance
Aug. 3	The triumph of integration: Will it increase departmental clout?
Sept. 7	Cut through the confusion: Effective communications management
Oct. 5	Farewell to system inefficiency: Software tools revive flagging productivity
Nov. 2	Network success: Making it happen

PRODUCT SPOTLIGHTS

Jan. 11	Terminals and terminal emulation
Jan. 25	Local-area networks
Feb. 8	DEC-compatible software
Feb. 29	Performance management tools
March 14	Database management systems
March 28	Micro-to-host links
April 11	IBM PC compatibles
April 25	Corporate electronic publishing
May 9	Nonimpact printers
May 23	Data communications
June 6	CASE products
June 20	The SNA market
July 11	Disaster prevention and recovery
July 25	Programmer productivity tools
Aug. 8	Software for the IBM mid-range
Aug. 29	The DB2 market
Oct. 17	Artificial intelligence
Oct. 31	The Unix market
Nov. 14	PC graphics
Dec. 5	LAN software
Dec. 19	IBM and compatible products

EXECUTIVE REPORTS

Jan. 18	Health care MIS: Shaking off 15 years of DP-as-usual
Feb. 1	Getting to the core of the new Apple
Feb. 15	High-tech security: Can biometrics secure your shop?
March 7	Airline MIS: Carriers land profits by empowering DP units
March 21	The restructuring of MIS: Business strategies take hold
April 4	Human resources MIS: In search of business savvy
May 2	Users say EDI cuts inventory costs, speeds product delivery
May 16	The schooling of MIS: Are you meeting the need?
May 30	The CIM connection: Reaching out to the shop floor
June 13	Connecting DEC and IBM without ruffling feathers
June 27	Try a systems model for large PC net launches
Aug. 15	Banking MIS: Banks seek higher yield from info systems investment
Sept. 26	TCP/IP: Temporary glue or long-term alternative?
Oct. 10	Users find less pain, more gain with outside specialists
Oct. 24	Government MIS: State, local systems drafted for front-line public service
Nov. 7	Control of large networks no dog-and-pony show
Nov. 21	Pinched at the root by bypass, AT&T offshoots push services
Nov. 28	Retail MIS: Store systems help retailers give shoppers what they want
Dec. 12	ISDN: Even users who see promise are still troubled by questions

SECTION FEATURES

Jan. 11	Management	But I don't *want* to be a manager
Feb. 1	Software	Help for the paper chase
Feb. 8	Networking	Seoul training: PC net goes for the gold
Feb. 15	Management	Cost control dominates in new MIS hiring season
Feb. 22	Networking	LAN diagnostics: Pinpointing trouble spots
March 7	Management	Management tools: MIS managers catch up with technology
April 4	Management	Grooming managers pays long-term dividends
April 18	Systems	Distributed data processing: Sharing the wealth
May 9	Management	Ready or not, here comes AI
May 23	Management	Living the Japanese way of MIS
June 6	Management	A look at certificates: What are they worth?
June 27	Management	In serving top execs, ESS politics can be deadly
July 25	Management	Creativity in MIS: Are bright ideas lighting up your shop?
Aug. 22	Management	What do execs really want (from MIS)?
Sept. 5	Systems, Software	Pick flourishing on PCs
Sept. 26	Management	When the walls of MIS come a-tumblin' down

You be the judge.

Return this card for free information on Bull's new non-impact printing technology. We'll send you an informative user study* and a detailed data sheet. That way you can see for yourself why we call it a Prize Bull.

Name _____

Title _____

Company _____

Address _____

Phone _____

Print Volume _____ pages/month

CPU: DEC _____ IBM _____ Other _____

Application(s) _____

Bull Peripherals

Bull Peripherals Corporation, 303 Wyman Street, Waltham, MA 02154

*"Magnetography – A User Study" by Datek Information Services.

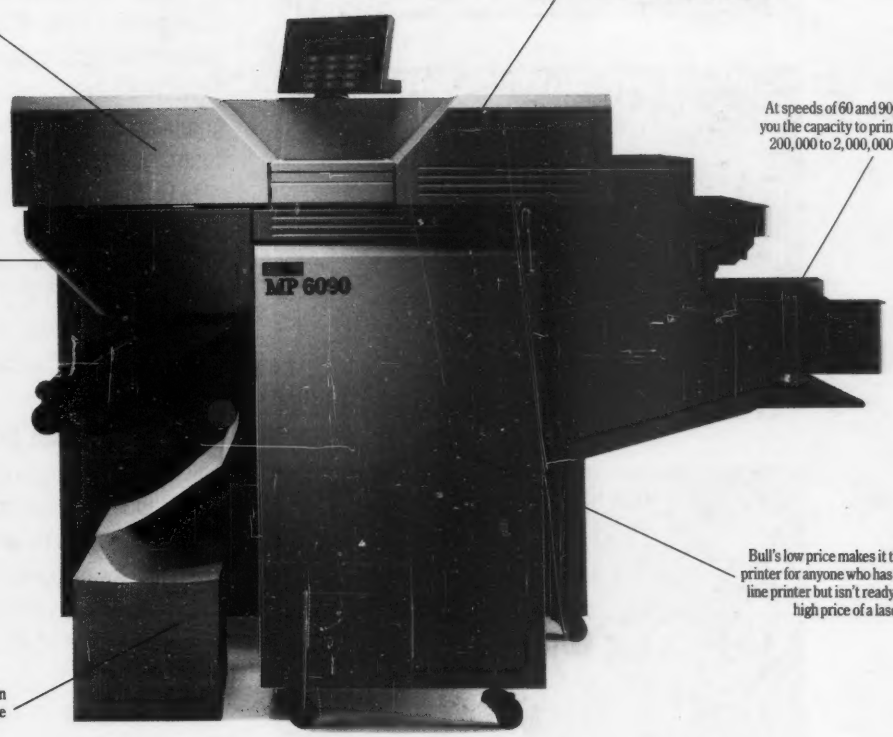
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 05329 WALTHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

BULL PERIPHERALS CORP.
303 Wyman Street
Waltham, MA 02154-9725

The anatomy of a prize Bull.



Bull printers are built to handle everything from tags, labels and bar codes to custom forms.

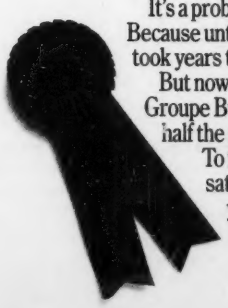
We know how precious your floor space is. At 64" x 30" we occupy far less of it than most high-speed printers.

At speeds of 60 and 90ppm, Bull gives you the capacity to print anywhere from 200,000 to 2,000,000 pages a month.

Fewer moving parts mean fewer tune-ups and repairs. And our straight-through paper path virtually eliminates jamming.

Bull's low price makes it the perfect printer for anyone who has outgrown a line printer but isn't ready to pay the high price of a laser.

Finally, you don't have to change paper in order to change printers. Bull can handle green bar and a wide variety of other fanfold paper stocks.



First prize in the printing arena ought to go to the company that solves the toughest customer problem. It's a problem that anyone who needs to print more than fifty pages per minute knows firsthand. Because until now, they had to buy a printer with twice the capacity they really needed. And a price that took years to grow into.

But now there's Bull. A blue-blooded descendant of the $3 billion worldwide systems supplier, Groupe Bull. Thanks to a new non-impact technology Bull offers blue-ribbon performance for about half the price of a comparable laser printer.

To find out more about how well a Bull runs, call or send for free copies of an independent customer satisfaction report* and detailed data sheet. That way you can see for yourself why we call it a prize Bull.

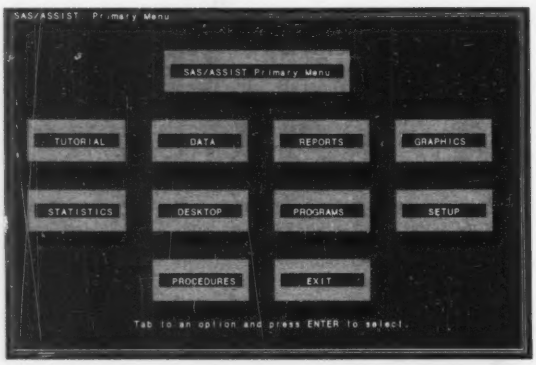
1-800-541-BULL

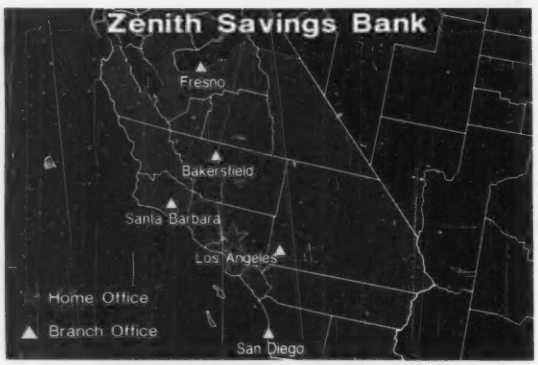
Bull Peripherals

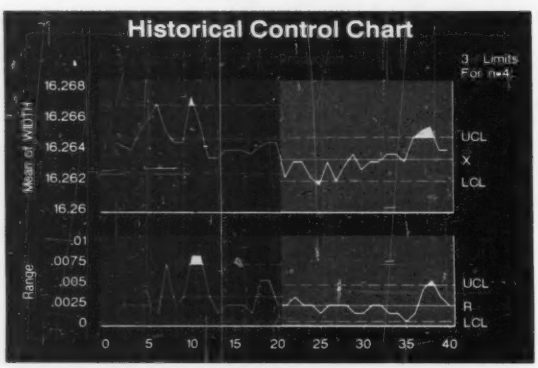
*"Magnetography – A User Study" by Datek Information Services. Bull Peripherals Corporation, 303 Wyman Street, Waltham, MA 02154

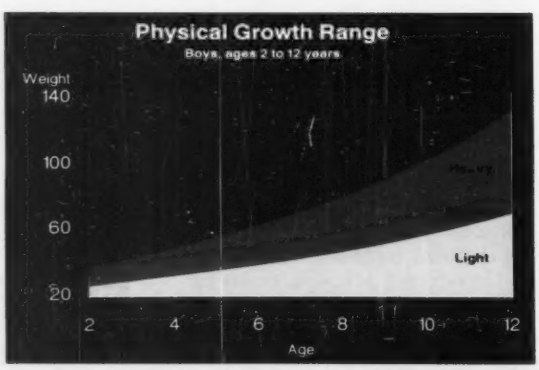
The SAS® System

More Choices, for More Applications, than Any Other Software.









The SAS System is the software you'll never outgrow. No other software offers so many choices for data management, analysis, and presentation. For any user— new computer user to seasoned pro. For any environment—PC to technical workstation to minicomputer to mainframe.

Choices to Build On. Start with a powerful English-like language and essential data management tools. Then take your pick of ready-to-use applications: statistical and mathematical analysis...report writing and color graphics...project management and quality control... forecasting and decision support.

Or build your own menu-driven applications— quickly and easily— with the SAS System's interactive applications development tool. Even first-time users can command the power of the SAS System... just by filling in the blanks.

Choices to Count On. More than a million users throughout the world— in business, industry, government, science, and education— have made the SAS System their #1 choice for data analysis and color graphics. And **every** SAS System application is backed by expert technical support, documentation, and training.

We'll tell you more in a free 12-page executive summary. Just give us a call at (919) 467-8000. In Canada, call (416) 443-9811.

SAS®

SAS Institute Inc.
Software Sales Department
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Fax (919) 469-3737

The SAS System runs under IBM Corp.'s MVS, CMS, and VSE; Digital Equipment Corp.'s VMS®; Data General Corp.'s AOS/VS; Prime Computer, Inc.'s PRIMOS®; Sun Microsystems, Inc.'s SunOS™; Hewlett-Packard's HP-UX; Microsoft Corp.'s MS-DOS®; and IBM Corp.'s PC DOS.

Copyright © 1988 by SAS Institute Inc. Printed in the USA.

TAKING CHARGE

Michael Pepelea

Clearing the air

The benefits of data normalization in creating effective data structures are easily recognized by most database administrators. But many MIS executives have misconceptions about data normalization, and these misconceptions prevent them from supporting it within their organizations.

Considering the background of many MIS executives, it is easy to understand why misconceptions develop. Many of those MIS executives achieved success because of their past technical superiority. But these skills were developed when life in the MIS world was much different than it is today. Flat files were the technology of the day. Only a few database management systems were available. Data sharing and distributed data structures were not major issues. Mainframe applications were the rule, and portability of data and connectivity were theoretical issues. Many MIS executives still view data issues from the perspective of that environment.

If a database administration hopes to gain MIS executive support for data modeling, it must address some of these misconceptions. MIS executives will then be more inclined to support a data normalization approach.

One of the first misconceptions relates to systems design. It holds that normalization is a process engaged in by technical people with little regard for

Continued on page 60

Doing more with less

Fleet's DP consolidation task falls to Zucchini

BY DAVID A. LUDLUM
CW STAFF

"I'm not everybody's favorite person around here," confided Michael R. Zucchini, chief information officer at Fleet/Norstar Financial Group, Inc., as he stepped from his red Jaguar sedan toward Fleet/Norstar's data center in Providence, R.I., earlier this year.

It is not that Zucchini is unlikable; he was referring to fallout from his consolidation of data processing and bank operations after Fleet Financial Group, Inc. merged with Norstar Bancorp, Inc. a year ago.

Since then, Zucchini has supervised 225 system conversions and the closing of seven data centers, including the one in Providence.

The actions resulted in the elimination of 150 jobs, about half of them layoffs. "It's been a year where every skill I've been able to develop over the years has been needed," Zucchini said in a follow-up conversation last month.

Zucchini, 42, grew up in New York's Bronx borough, earned undergraduate and graduate business degrees at Pace University, served in the Army and became a programmer. More recently, he has bred race horses as a hobby and served on President Reagan's Private Sector Survey on Cost Control, known as the Grace Commission.

Fleet Financial Group hired Zucchini as executive vice-president and CIO in August 1987, four months before completing the anticipated merger with the Albany, N.Y.-based Norstar.

Lineage

Zucchini came to Fleet from Stamford, Conn., reinsurance company General Re Corp., where he was president and chief executive officer of the DP subsidiary. In 1987, he won an award from Carnegie-Mellon University for General Re's Confer system. The system provides underwriters, sales staff and customers with data on accounts and reinsurance policies previously stowed in a warehouse. In 1986, Zucchini patented an outlet for portable computer terminals.

With assets of $26 billion, Fleet/Norstar ranks 23rd among the nation's bank holding companies. Brokerage firm Smith Barney, Harris Upham & Co. ranked it as the top performer among regional U.S. bank holding companies for the third quarter of 1988. With 19,000 employees, seven banking companies in four states and a total of 1,000 offices in 40 states and London, it is a leader among the growing breed of "superregional" banks.

Zucchini is CEO of Fleet/Norstar Services Corp., a 3,300-person subsidiary handling bank operations and DP.

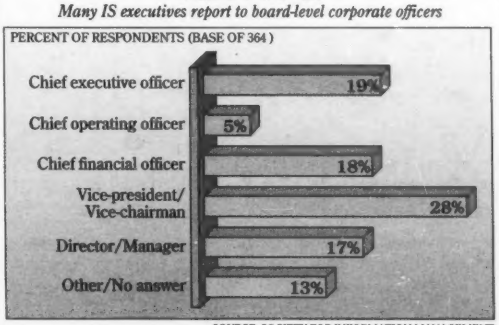
He is also CEO of Fleet/Norstar Business Data, Inc. in Newington, Conn., a DP service bureau formed in October, and is responsible for DP at Fleet/Norstar subsidiaries that provide

Continued on page 59

Data View

Who's the boss?

Many IS executives report to board-level corporate officers



SOURCE: SOCIETY FOR INFORMATION MANAGEMENT
CW CHART

PROFILE

Michael Zucchini

MARTHA EVERSON

Position: *Chief information officer, Fleet/Norstar Financial Group, Inc.*

Mission: *To consolidate bank data processing and operations in the wake of mergers while maintaining day-to-day activities and expanding nonbanking data processing opportunities.*

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any job changes in Managers on the Move. When you have news about staff changes, be sure to drop a note or have your public relations department write to *Computerworld*, 375 Cochituate Road, Framingham, Mass. 01701.

A different channel to train MIS

BY ALAN J. RYAN
CW STAFF

MIS, the harbinger of technology for corporate America, is finding itself relying more and more heavily on high-tech solutions to train and educate its devotees.

Interactive video, teleconferencing and pay-per-view seminars are practical, usually save money and time and can actually increase productivity, according to companies using them.

One of the most visible techniques available for MIS learning is The Computer Channel, Inc., a 4-month-old pay-per-view series of seminars on topics such as networking, databases and OS/2.

The program is broadcast via satellite and is geared toward the middle levels of MIS organizations. Each program typically lasts four hours and eliminates what in some cases would be two days spent traveling. A decided advantage of the live television broadcast is its question-and-answer sessions, during which the audience can participate in the conference and share opinions or questions with the speakers over the telephone, subscribers to the show said.

At the Marriott Corp. in Bethesda, Md., many methods of video training are used, including videotapes and The Computer Channel. Both are cost-effective, said Larry Bryan, technology advancement coordinator for the hotel chain. "We find that video training is much more cost-effective" and more consistent than training people who will in turn have to travel to other sites to train others, he said.

Furthermore, there can be even more cost savings through satellite conferencing because there are no production costs like those associated with creating in-house videos, Bryan said. "We're counting more on the compelling information to be the focus of the broadcast, not the production that you have to have on videotape to maintain audience appeal and interest," he said.

Some companies are using a combination of many technologies, including television. The Memphis, Tenn., headquarters of Federal Express Corp. is also the headquarters of FXTV, an in-house television network that is used at 700 Federal Express sites throughout North America.

Dave Flanagin, senior manager of video systems development at Federal Express, said the company's FXTV system was such a hit when it was implemented a year ago that it outstripped its projected schedule and is being used to broadcast programs on a daily basis. While FXTV has the ability to be used for MIS training, Flanagin said the MIS department is more likely to use the available interactive video training.

Flanagin said that FXTV has essentially replaced both a printed publication and videotapes within the corporation: "We

Continued on page 58

Power once reserved
building rockets is now

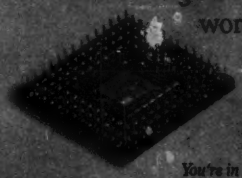
for pondering physics taking care of business, too.

People who work with powerful 386 personal computers used to be called rocket scientists. Now they're also called accountants, engineers, managers and CEO's. Thanks to the new COMPAQ DESKPRO 386/20e.

It delivers 386 power to people whose demanding needs have outgrown their 286 PC's. Plus, it packs this power into a design that fits on your credenza.

Introducing the COMPAQ DESKPRO 386/20e. 20-MHz 386 performance designed to fit the increasingly sophisticated needs of 386 users.

Start with speed. Everything in the new COMPAQ DESKPRO 386/20e is optimized to go faster. So you can work faster.



You're in business with a 20-MHz 386 microprocessor.

Its 20-MHz Intel 386™ microprocessor with cache memory is surrounded by the exclusive COMPAQ Flexible Advanced Systems (Flex) Architecture. This high-speed combination runs the world's largest library of software 25% faster than the IBM PS/2 Model 70-121 and other non-cache 20-MHz 386-based PC's. And 50% faster than the IBM PS/2 Model 70-E61 and other non-cache 16-MHz 386-based PC's.

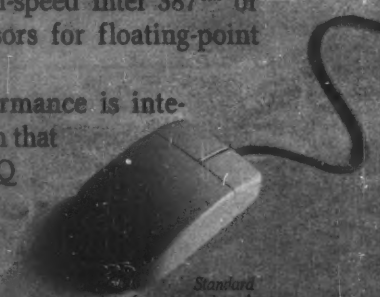
Its 32-bit design also takes 386 software and multitasking operating systems such as Microsoft® Windows/386, MS® OS/2, XENIX® and UNIX® to their maximum potential.

A long list of high-performance features is built in. One megabyte of memory. VGA graphics. Standard interfaces. And support for 5¼" and 3½" diskette drives.

Of course you have growth potential. Five expansion slots are available: four for a network card, modem or other devices, and one high-speed 32-bit slot to expand memory in increments up to 16 megabytes.

Need options? Add two high-performance fixed disk drives, with 110 or 40 megabytes of storage; 135- or 40-megabyte tape backups; and high-speed Intel 387™ or Weitek 3167 coprocessors for floating-point applications.

All of this performance is integrated into a sleek design that makes the COMPAQ DESKPRO 386/20e the ultimate space vehicle.



Standard interfaces are on board.

For a free brochure and the location of your nearest Authorized COMPAQ Computer Dealer, call 1-800-231-0900, Operator 75. In Canada, 1-800-263-5868, Operator 75.

Choose 5¼" and 3½" diskette drives.

COMPAQ® is a registered trademark of Compaq Computer Corporation. Intel®, Intel 386 and Intel 387 are trademarks of Intel Corporation. Microsoft®, MS® and XENIX® are trademarks of Microsoft Corporation. MS® Windows/386 and MS® OS/2 are products of Microsoft Corporation. UNIX® is a trademark of AT&T. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. ™Registered U.S. Patent and Trademark Office. ©1988 Compaq Computer Corporation. All rights reserved.

COMPAQ

It simply works better.

Different channel

CONTINUED FROM PAGE 55

used to distribute something like 500 videos a year. Now we do almost all of that consolidated over FXTV."

Flanagin said FXTV, which has been in place for a year, is expected to justify its cost within five years of its inception.

Using a similar approach is J. C. Penney Co., at which the latest in video technology is not limited to training and MIS. There, the buyers for the retail stores simply watch the company's TV network to select product lines.

Another alternative is interactive videoconferencing capabilities, such as those in place at Harris Corp. in Melbourne, Fla. The company uses this capability to hold nationwide product releases from its home base to hotels across the country and to hold meetings with sales representatives or other Harris officials throughout the country or the world.

The Harris system continues to grow as a viable method to train people and trim travel costs, said Donald Wilkof, manager of corporate marketing support at the Customer Briefing Center.

One time, when Harris Chief Executive Officer John T. Hartley was scheduled to speak at a meeting of Harris' European sales representatives, he ran into a scheduling problem, Wilkof said. So he walked the short distance from his office to the teleconferencing room, where he spoke with the sales representatives via satellite. "Within an hour and a half, he was back in his office rather than going to London" and spending two days traveling, Wilkof said. "It's very cost-effective."

As the old saying goes, though, you can't please all of the people all of the time. Some people really enjoy traveling, Wilkof said, but there may be a way to resolve that problem. "We were even thinking of offering 1,000 frequent-flyer miles" for people who agreed to conduct teleconferences rather than travel, he said.

CALENDAR

JAN. 15-21

National Retail Merchants Association Annual Convention and Business & Equipment Exposition. New York, Jan. 15-18 — Contact: NRMA, 100 W. 31st St., New York, N.Y. 10001.

PTC '89, Conference of the Pacific Telecommunications Council. Honolulu, Jan. 15-18 — Contact: Pacific Telecommunications Council, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

SPIE/SPSE Symposium on Electronic Imaging: Advanced Devices and Systems. Los Angeles, Jan. 15-20 — Contact: Society of Photo-Optical Instrumentation Engineers, P.O. Box 10, Bellingham, Wash. 98227.

Computer Graphics New York. New York, Jan. 17-19 — Contact: Exhibition Marketing & Management Co., Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Supercomputing Solutions '89: New Technologies for Super Performance Computing. New York, Jan. 17-19 — Contact: Supercomputing Solutions '89, Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Executive Conference for Corporate Data Processing Managers. New York, Jan. 18 — Contact: International Data Corp., Box 955, 5 Speen St., Framingham, Mass. 01701.

Winter Conference of the National Association of Telecommunications Dealers. Palm Springs, Calif., Jan. 18-21 — Contact: NATD, 1255 23rd St. N.W., Washington, D.C. 20037.

MANAGEMENT BRIEFS

Managers: 'What, me worry?'

Turnover rates for top-level MIS and communications managers may be on the rise, according to some surveys, but now there is research that says individual managers feel safe in their personal positions.

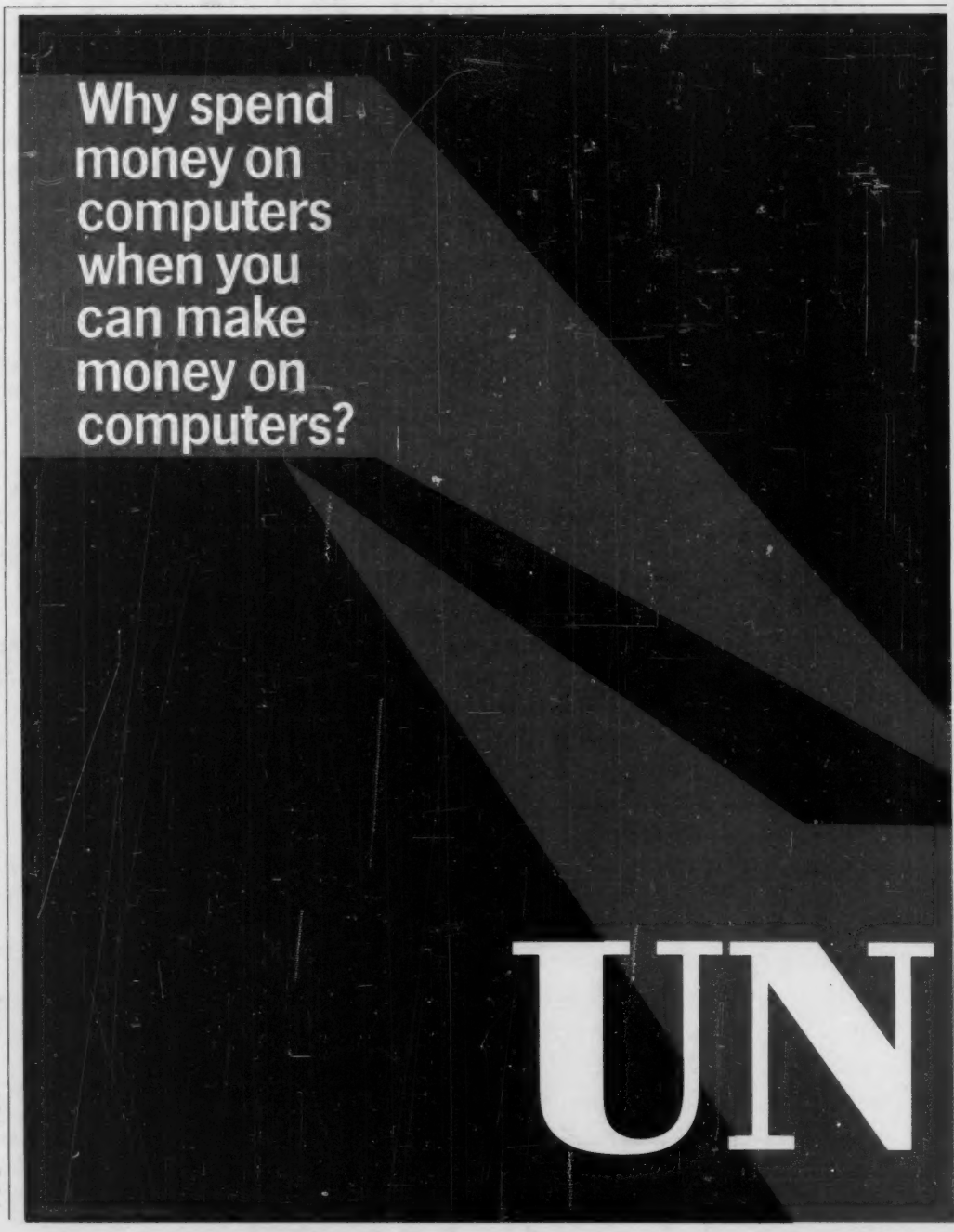
In a study released recently, the New York-based market research firm **Decisions Center, Inc.** asked 305 top telecommunications and MIS executives whether they are likely to lose their jobs during the next 1½ years. Almost all of the respondents — 94% — said that they felt safe. The managers also expressed little concern about a recession, with two-thirds saying a recession is unlikely in the next two years.

The IBM users group **Guide International Corp.** is planning its second information systems symposium with the goal of teaching senior executives about how information systems technology fits into the global economy. The preliminary list of speakers includes former U.S. Ambassador to the United Nations Jeane Kirkpatrick, author John Naisbitt, economist Lester Thurow and Jim P. Manzi, chief executive officer of Lotus Development Corp. The symposium is scheduled for Oct. 2-4 in San Francisco.

The **Association for Systems Management** has announced the keynote and special speakers for its annual information systems conference to take place May 7-10 in Dallas.

David J. Eskra, chairman of Pansophic Systems, Inc., will deliver the keynote, while a special address will be given by Robert F. Berland, vice-president in charge of IBM's Application Systems Division.

The newly formed **International DB2 Users Group** (IDUG), established at a Chicago meeting recently, has scheduled its first international conference for July 9-12 in Chicago. Information is available from IDUG, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.



More with less

CONTINUED FROM PAGE 55

processing for life insurers and issuers of student loans and mortgages.

In contrast to the consolidation in banking, Zucchini is decentralizing some of Fleet/Norstar's nonbanking DP. The company has completed a data center for Fleet Real Estate Funding Corp., a Columbia, S.C., mortgage firm that had been supported by the corporate data center. The new center provides more flexibility and greater economy, since redundancy features make use of the bank center more expensive.

But Zucchini has devoted most of his attention to banking. He has eliminated eight mainframes in closing the seven bank data centers and suspended use of three DP service bureaus.

The consolidation has cut annual DP expenses for the banks by more than $10 million, or 13%, and the banking DP staff by 25%, Zucchini says. Banking DP was consolidated in a former Norstar data center in Albany with an IBM 3090 Model 500E.

Fleet/Norstar is standardizing on the best of Fleet and Norstar systems and in some cases new ones, generally using in-house staff. Systems and programming staffs remain decentralized and have been reduced only through attrition.

Fleet/Norstar offered different positions to some DP employees whose jobs were eliminated and tried to be generous toward laid-off workers "both in emotional and financial support," Zucchini says.

Zucchini helped minimize layoffs by taking advantage of attrition — shifting vulnerable employees into vacated positions to be maintained and filling jobs slated for elimination with temporary consultants.

A sense of balance

Zucchini's handling of layoffs showed sensitivity but also a "strong sense of reality" required to address company needs, says Dave Sheppard, former Fleet DP chief and current co-chief operating officer of Fleet/Norstar Services. In addition, Zucchini learned the banking business very quickly, Sheppard says. "He has a tremendous amount of energy and a tremendous appetite for information."

J. Terrence Murray, the Fleet/Norstar president who hired Zucchini, says the company was attracted by Zucchini's organizational abilities more than his technical knowledge. He says Zucchini maintained day-to-day operations while moving forward with the restructuring. "Mike was successful because he was very focused on his goal and constantly moving toward it," Murray says.

Bob Drum, formerly Norstar DP chief and now co-chief operating officer with Sheppard, says Zucchini has "a way of getting to the nub of things," and a knack for generating agreement on objectives.

"I think Mike is probably one of the best communicators I've ever encountered in 27 years in this business — in listening as well as talking," Drum says. "I consider myself to be pretty good manager, and I've learned a lot of things from Mike."

MARTHA EVERSON

Zucchini *gets away from MIS shop*

Zucchini says the merger has given him more sensitivity to the need "to work through people and not around them."

Given the potential setbacks employees face in a restructuring, a successful leader needs to get them to see the value to the organization of doing things right, he says.

Zucchini still faces 35 to 50 system conversions, but he is looking forward to spending more time with his wife and daughter on the horse farm they are developing in Chepachet, R.I., which is 30 minutes from work, and his townhouse in Providence.

He should not worry about having too much idle time. Soon, Fleet/Norstar expects to complete the acquisition of the $1.9 billion Indian Head Banks, Inc. in Nashua, N.H. "We're beginning to look at it to see what path we should take," Zucchini says.

Most CEO's and senior managers look at computer operations as cost centers, not profit centers.

Unisys has helped many businesses use information to be more competitive. We've done it for banks. We've done it for airlines. We can do it for you.

Unlike most computer companies who focus on partial "solutions" to short-term, isolated problems, Unisys focuses on creating applications and hardware that can grow your business over the long haul.

We aren't just an industry leader in networking. We aren't just the maker of the broadest line of compatible computers. And we're not just the creator of the most flexible software tools available. We are all these things.

And we have the expertise to tie it together so you can turn your information generator into a cash generator. Work with us and we'll prove it.

UNISYS AND YOU.
The power of 2

iSYS

DISOSS
DOCUMENT STORAGE REPORTER
Find out what's in your DISOSS library and PS/CICS document pool.
• Reports on all documents
• Runs while DISOSS is active
• SMF accounting records
• Free 30-day trial
TBS Software Inc.
249 Tempo Avenue
North York, Ontario
Canada M2H 2R9
(416) 221-5140

Pepelea

CONTINUED FROM PAGE 55

business issues. Therefore, data normalization does not address business needs and offers no benefit to the system design process.

Nothing could be further from the truth. Database administration must point out that the first thing the data normalization process does is define the way in which users will access the data. These are called "user views" or local views and are obtained by reviewing user-defined screens and reports and investigating data flow diagrams, which should be defined with user assistance. Data normalization does not exclude business needs but is based on user requirements.

Another common design misconception of data normalization is that it is unnecessary because structured analysis and design techniques define data relationships.

Structured analysis and design are essential to good system design. They must be done to define processing requirements. However, structured analysis focuses on processes, not data. Structured analysis will provide data relationships and passage of data from process to process. That macro view does not define the interrelationships of data element to data element, which is the micro view. It is this view that is needed by database administration to construct databases to support the new system. This view of data can only be achieved through a rigorous data normalization effort.

IF A DATABASE administration hopes to gain MIS executive support for data modeling, it must address misconceptions. MIS executives will then be more inclined to support a data normalization approach.

Another misconception is the physical database implication of normalized data. Key misunderstandings are that data structures produced from normalized data models contain too many segments or sets, have large access paths, require huge I/O operations and require complex key relationships. Thus, the databases generated by the data normalization process will perform poorly and be difficult to work with.

While it is sometimes true that normalized data structures may contain more segments than the traditional methods, this can be an enhancement rather than an inhibition to performance. Because the user views define data access requirements, data needed by a portion of the applications centers in well-defined segments. This means that the application does not have to access data that is scattered all over the database. Thus, performance is better in data-normalized structures because I/O is better controlled and defined.

With normalized data structures, data and multiple access paths are defined only once. Data redundancy is reduced in comparison with traditionally designed data structures, eliminating the need for special maintenance routines to keep data synchronized. Furthermore, less updating takes place for singularly defined data than data defined in multiple ways. Thus, system performance is enhanced.

Easier development

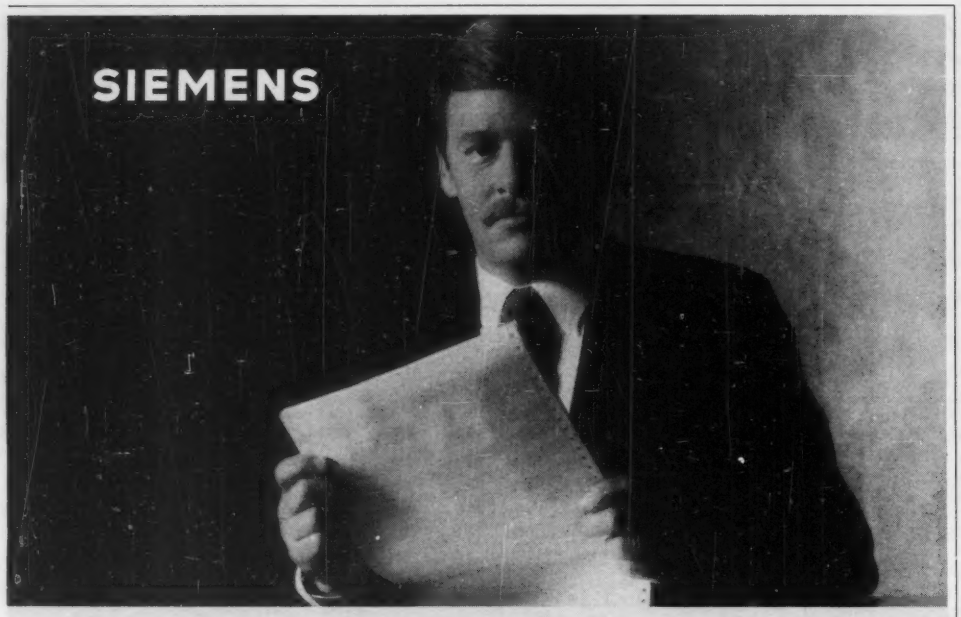
Last, because normalized data structures are neatly organized and data is organized by access requirements, program development is easier than it is with traditionally developed databases. Programmers need to access fewer data segments because program functions address logically grouped data. Also, because data relationships and key requirements are defined up front, programmers are not faced with "surprise" data needs that may require reprogramming and reworking of the database.

If these misconceptions of data normalization can be addressed, the only issue remaining is technology. Some MIS executives still feel that data relationship problems can be corrected with physical techniques in the DBMS.

Many MIS executives believe that rigorous data normalization is not necessary because the physical aspects of a DBMS will allow the database administrator to fix data relation problems. This belief may be partially true in the traditional hierarchical, networked or inverted file structures. But in a relational environment, failure to properly define data relationships can cause serious problems.

Database development for a relational environment must be different. In the relational world, much of the access to data, how indexes are established and how access paths are optimized is done under the covers. The database administrator or application programmer does not have the same level of physical control as he did with past DBMSs. Rather, the basis for control in a relational environment is the relationship of one data element to another. The way data is related dictates access and performance. The way to achieve this relationship is through a rigorous data modeling exercise.

Pepelea is a manager in the IS consulting practice of Ernst & Whinney in Chicago.



"We doubled our print capacity and reduced paper costs by 60%. thanks to the printer professionals"

"Bright Banc is one of the largest and fastest growing banks in Texas. Headquartered in Dallas, with 45 branches throughout the state and plans for spectacular future growth it's no surprise that the demands on our data processing department are staggering.

We produce 35.2 million pages a year. 50 different forms and reports. And we process a minimum of 25 nights a month.

So, when I was charged with increasing data processing productivity, I knew the solution was laser technology. The question was...whose laser printers?

We spent months weighing the alternatives...analyzing our existing impact printers...other manufacturers...and Siemens. We measured speed. Reliability. And above all cost. And when all was said and done, the choice was clear.

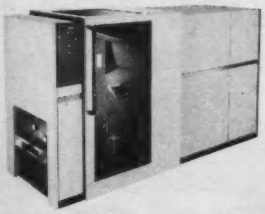
We could install Siemens Laser printers for less than it cost to run our existing impact printers. 22% less than the competition. And we could cut our paper costs by 60%. To print a 1,000 page report on impact printers we'd have 1,000 3-part sets – with a paper cost of $30. With Siemens laser printers each copy is an original ...and paper cost only $13.

Now, with Siemens high-speed laser printers our print quality is higher than ever, we never miss a deadline, we can expand without increasing costs...and we keep more of our money where it belongs...in the bank. And *that's* a 'Bright' idea."

J. Hilburn

Jim Hilbun
Senior Vice President
Director of Production Services,
Bright Banc

High-speed laser printing systems



Contact the Printer Professionals at:

Siemens Information Systems, Inc.
Peripheral Systems Division
240 East Palais Road
Anaheim, CA 92805
(714) 991-9700

CC3030-020A WLM 8

YOU NEED SOMETHING MORE SOPHISTICATED FOR TODAY'S COMPUTER RESOURCE MANAGEMENT PROBLEMS. YOU NEED PRIME.

Putting out fires – it's part of every MIS/DP Manager's job.

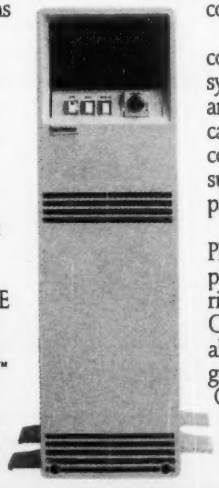
From false alarms in finance to panic in personnel, you just get one problem solved when another one threatens to rage out of control.

But how do you contain your resource management fires – such as data management and access problems, weak communications, and limited applications development?

The PRIME EXL™ Series of multiuser, multitasking supermicrocomputers.

Based on Intel386™ technology, these fully compatible systems, running Prime's implementation of AT&T's UNIX System V.3, are the most efficient tools for managing computer resources within your company.

But not only does the PRIME EXL Series support UNIX,® with optional software packages your users can run their existing DOS™ and PICK® applications as well. You'll also be able to develop custom applications for departmental computing problems now with the security that they'll work just as well in the future.



Plus, you'll have industry-standard communications capabilities through Ethernet™ over TCP/IP networking software, our PRIME/SNA™ EXL products, and PC-Interface.™ This provides the ability to share peripherals and ensures your access to vital information from departments or your corporate mainframe and PCs.

Designed to grow with your company, all PRIME EXL Series systems are fully compatible. There are a variety of configurations you can choose. And, of course, you can count on the worldwide service and support only a Fortune 500 company like Prime can provide.

To find out more about the PRIME EXL Series, simply complete and mail the coupon to the right. Or call 1-800-343-2540. In Canada, call 1-800-268-4700. We'll also send you a *free* copy of "Integrating the Desktop and Multiuser Operating Environments." It's a straightforward discussion of computer resource management in the UNIX/DOS environment.

So call today. Because now more than ever, you need the right tools to extinguish your computer resource management fires – and prevent them in the future.

You need Prime.

☐ **Putting out fires is a big part of my job, so I'm asking for Prime.**

Please send me more information about the PRIME EXL Series, and don't forget my *free* copy of "Integrating the Desktop and Multiuser Operating Environments."

☐ Please have a Marketing Representative contact me.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____

Applications Interest _____

Industry Interest _____

Or if you prefer, call **1-800-343-2540.**

Mail to: Prime Computer, Inc.
MS 15-60, Prime Park, Natick, MA 01760. AD0270041

Prime.

PRIME and the Prime logo are registered trademarks, and PRIME EXL and PRIME/SNA are trademarks of Prime Computer, Inc., Natick, MA. Ethernet is a trademark of the Xerox Corporation. PC-Interface is a trademark of Locus Computing Corp. Intel386 is a trademark of Intel Corporation. UNIX is a registered trademark of AT&T Information Systems, Inc. MS-DOS is a trademark of Microsoft, Corp. And PICK is a registered trademark of Pick Systems.

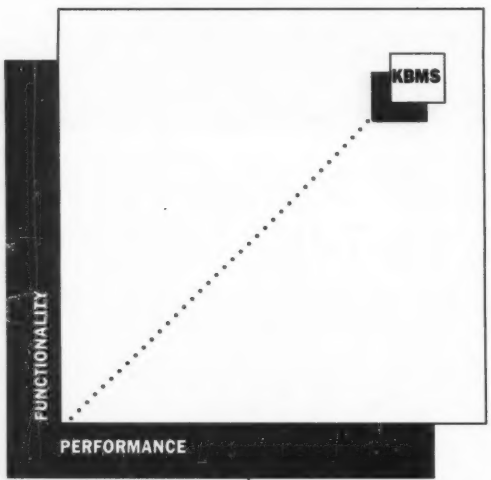
SEE US AT DB/EXPO 89, JANUARY 31 - FEBRUARY 2
HYATT REGENCY, SAN FRANCISCO, BOOTHS 220 AND 221

High performance in knowledge base systems: KBMS.

KBMS
KNOWLEDGE BASE MANAGEMENT SYSTEM

Performance. For knowledge base systems in the IBM mainframe world, it isn't a technical issue. It's a practical one.

Will your knowledge base system be able to perform in the real-world environment of your business? Will it be able to keep up with the demands of high-volume applications? Can it access your database quickly and easily?



AICorp, a leader in AI-based mainframe applications for more than 10 years, has the only real answer to these questions: KBMS, the Knowledge Base Management System.

KBMS is the first knowledge base system with the performance you need for building production applications in your business. Because it's the first system designed from the ground up for high-volume, transaction processing.

Effective resource utilization

KBMS is a true multi-user system that includes multi-threaded processing, and backup and recovery features to ensure the integrity of your applications. It uses a central server architecture for concurrent access from different subsystems, such as CICS, IMS/DC, TSO and batch programs. The code, written in C, is reentrant and shareable.

KBMS is highly efficient at database access, including DB2, IMS, ADABAS, VSAM and SQL/DS. It even automatically generates the SQL for relational DBMSs like DB2. And KBMS offers full "above-the-line" MVS/XA support to allow a large number of users to access KBMS applications.

The result: only KBMS delivers strong AI functionality with efficient performance in your IBM environment, allowing you to build true multi-user production applications.

Send for the free Executive Guide.

We've prepared a free Executive Guide on the concepts and applications of knowledge base systems. It provides a clear, concise overview of this emerging technology, and answers the most frequently asked questions about knowledge base systems.

Shouldn't you learn the facts about performance in knowledge base systems? For your free Executive Guide, please call (617) 890-8400. Or write AICorp, 100 Fifth Avenue, Waltham, MA 02254-9156.

AICORP

Bringing AI Software to Business

KBMS.

The only practical knowledge base management system for your IBM mainframe environment.

KBMS is a registered trademark and INTELLECT is a trademark of AICorp, Inc.

INDUSTRY INSIGHT

Lee Gruenfeld

Bankruptcy rewrite gives users a break

At last there is some potential good news for users of licensed software. It appears that Congress has finally gotten around to acknowledging that there may be a difference between an application package and a novel.

In October, Senate bill S. 1626 amended the Bankruptcy Code in a way that may offer better protection to licensees or customers whose vendors become bankrupt.

The original problem, which extends well beyond the concerns of software users, is complex but can be reduced to its essentials with a bit of oversimplification.

It is common practice for software vendors to withhold source code from their customers. Generally, if the customer does not intend to modify the programs and instead relies on the vendor for upgrades, this is an acceptable arrangement as long as the vendor remains financially viable.

But what does the customer do if the vendor becomes unable to continue support of the product? The traditional mechanism

Continued on page 66

AT&T makes up its mind in '89

Giant begins new year with aggressive gambits, buyouts, partnerships

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Determined to shed its aura of indecision and marketing ineptness, a seemingly revitalized AT&T has entered 1989 with a flurry of announced partnerships with, and planned purchases of, communications competitors.

AT&T last week announced that it had formed a joint venture with GTE Corp. that reportedly will result in the sale of GTE Communications Systems' central office transmission equipment to AT&T.

Two weeks ago, AT&T launched an aggressive bid to purchase Paradyne Corp., a once-successful data communications equipment manufacturer that came upon hard times after pleading guilty to charges that it conspired to defraud the U.S. government [CW, Dec. 26].

Two months ago, AT&T said it would purchase Harris Corp.'s Pactnet satellite ground station technology, which is used to provide satellite-based networks [CW, Nov. 28]. The acquisition included a line of very small-aperture terminal earth stations already marketed by AT&T.

AT&T-IBM gateway

Later this month, AT&T is expected to unveil an alliance with Cincom Systems, Inc. The agreement is intended to provide a gateway between AT&T's Unified Network Management Architecture and IBM's competing product, Netview.

Last week's GTE announcement revolves around AG Communications Systems Corp., a joint venture first announced in July that was designed to bring Integrated Services Digital Network and other advanced technology features to GTE's digital telephone switching systems.

A related agreement calls for AT&T to license certain 5ESS Switch and related technologies to AG.

Financial terms of the deal were not disclosed, but the partners did reveal that GTE will initially hold a 51% interest in the firm, with AT&T eventually assuming 100% ownership after 15 years.

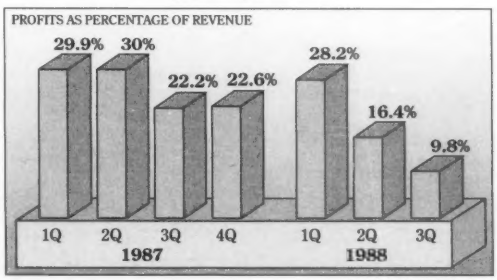
Headquartered in Phoenix, the new company is composed of the network-switching business of GTE Communication Systems. All GTE Communication Systems' assets and its 4,900 employees have been absorbed into AG, including the Phoenix-based headquarters, principal research and development complex and manufacturing plants in Illinois.

Jack M. Kirker, former president of GTE Communication Systems, heads up the jointly owned company as chief executive officer and reports to a board of directors representing GTE and AT&T.

Data View

IBM leasing: Shrinking margins

Aggressive pricing and intense competition squeezed IBM Credit Corp.'s profit margins in 1988



SOURCE: ANNEX RESEARCH
CW CHART

Gandalf pulls end-user strategy out of its hat

BY JEAN S. BOZMAN
CW STAFF

WHEELING, Ill. — Gandalf Technologies, Inc. wants to get out from behind the corporate mainframe.

For 18 years, the Canadian firm made a fine living by selling modems, multiplexers and other black boxes. Most of them typically resided in the far corner of the computer room, out of the way and largely unnoticed. They were usually reliable, making Gandalf a low-profile vendor in most large data processing shops.

But last year, Gandalf made a break with its solidly successful past. It decided to market a new kind of product that would link personal computer clusters and local-area networks directly to the outside world, bypassing DP's glass house altogether. Gandalf calls the new product series, known as Starmaster, a hybrid network system.

"We're trying to avoid the mind-set that my box is faster than your box," said Howard J. Gunn, vice-president of corporate planning at Gandalf's U.S. marketing center in this Chicago suburb. "We're trying to give the end users the techniques they need to run their business."

Gandalf's bold product move comes at a time when its own business needs a boost. The company reported flat revenue of $29.4 million ($35 million Canadian) for its first quarter ended Oct. 29 and a $1.13 million ($1.35 million Canadian) loss in the same period.

Although revenue surged up to $137.3 million ($163.5

Continued on page 65

Female executive bucks trend at Japan's Ricoh

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — Almost as rare in Japan as a woman with corporate power is a woman with a graduate degree in computer science. Hideko S. Kunii has both, and she is leading Ricoh Corp.'s effort to establish a software research center here.

Commuting from Tokyo, where she created Ricoh's database management software laboratory, Kunii spends one week per month here. Such voluntary separation from a husband is nearly unheard of in Japan.

"My husband can take care of himself, unlike typical Japanese men," she says.

Kunii holds out her hands and wiggles her fingers when describing just how few women have reached her rank in the Japanese business world. She says statistics from public corporations there show that only one out of 1,000 managers is a woman, "and that includes department stores."

Some Japanese social structures work against bringing women into the workplace. Most glaring, according to Kunii, is the discrepancy between men and women when they are first hired.

Ricoh's Kunii

"There are two structures for women but not for men," she says. When women are hired, they are asked whether they are on a career path or a noncareer path. She says if they choose a career, they are told they may be separated from their families by being forced to move at the company's request.

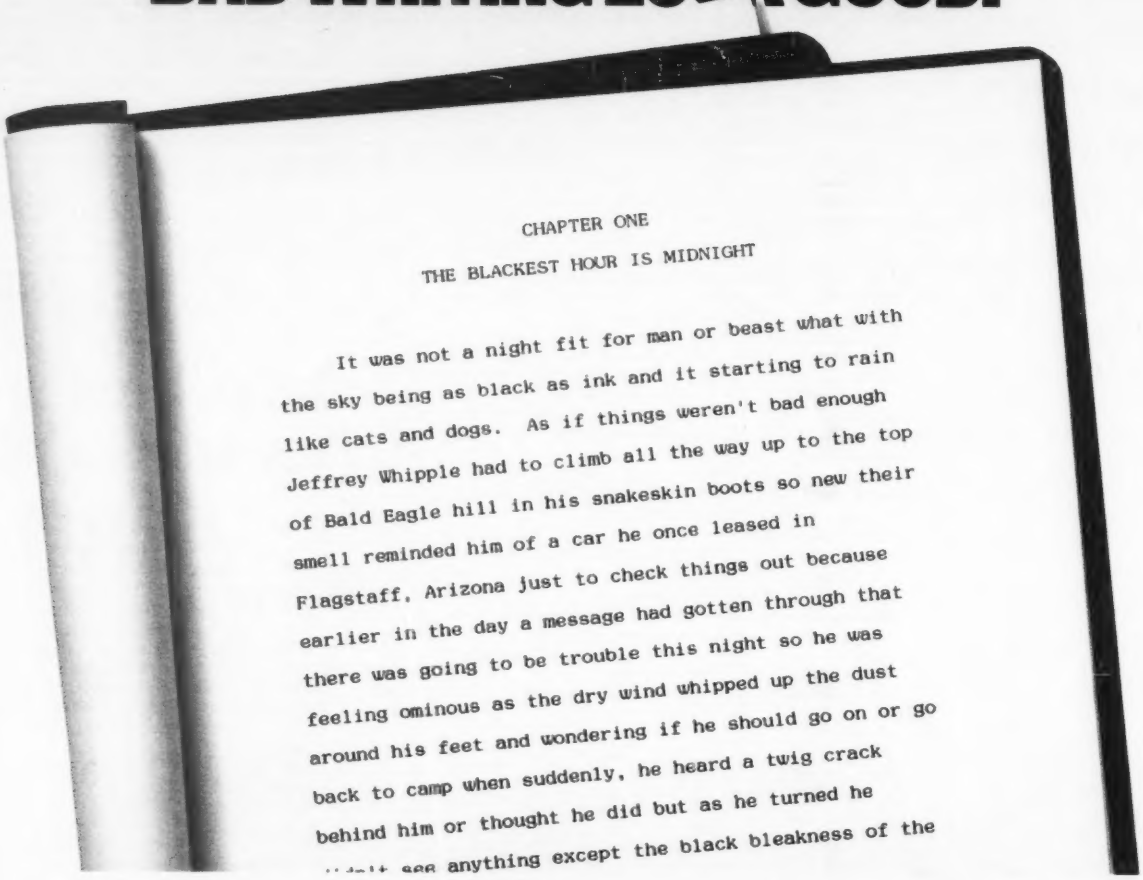
While Kunii is hardly traditional, she is swayed by the company's bottom line. "Often, we train women who then quit to have a family. I can see two sides."

Kunii, who studied for her Ph.D. at the University of Texas in Austin, is attempting to recruit U.S. engineers for Ricoh's development laboratory. Coming from a country where new hires only get one shot at a job and are placed there for the rest of their lives, she says she may have an easier time building staff here.

"In Japan, industry has a handicap," Kunii says. "They have to educate after hiring." There are 100 times more undergraduate students in computer engineering here than in Japan and 20 times more graduate students. Often, she says, computer companies in Japan recruit liberal arts students for highly technical jobs. Another major difference is that in Japan, recruitment of employees from other Japanese companies is nearly taboo.

With her partial U.S. schooling, Kunii may take a more global view than some of her Japanese colleagues. "We're such a uniform country, but communication of information is so worldwide," she says.

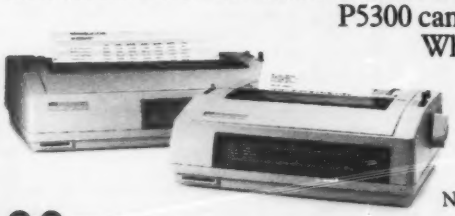
OUR NEW PRINTERS MAKE EVEN BAD WRITING LOOK GOOD.


CHAPTER ONE
THE BLACKEST HOUR IS MIDNIGHT
It was not a night fit for man or beast what with
the sky being as black as ink and it starting to rain
like cats and dogs. As if things weren't bad enough
Jeffrey Whipple had to climb all the way up to the top
of Bald Eagle hill in his snakeskin boots so new their
smell reminded him of a car he once leased in
Flagstaff, Arizona just to check things out because
earlier in the day a message had gotten through that
there was going to be trouble this night so he was
feeling ominous as the dry wind whipped up the dust
around his feet and wondering if he should go on or go
back to camp when suddenly, he heard a twig crack
behind him or thought he did but as he turned he
anything except the black bleakness of the

We're sorry that our new 24-wire Pinwriter® P5200 and P5300 printers can't do much for the quality of your writing. But they can certainly do wonders for the way it looks. The secret is the ribbon. Other dot matrix printers only use a fabric ribbon. Our Pinwriters print with both a fabric and a letter-quality, multi-strike film ribbon—the same kind used on executive typewriters.

The NEC Pinwriters can also enhance your writing in other ways. They have seven resident type styles. Plus four more are available on plug-in font cards. Which means you can express your thoughts with just the right typeface. You can also get an inexpensive, user-installed color option. And if graphics are part of your story, these Pinwriters produce the highest resolution of any printer you can buy.

Call NEC Information Systems at 1-800-343-4418 to see how much better our new Pinwriter P5200 and the wider P5300 can make your writing look. Whether you're a budding Hemingway, or a Hemingway & Company.



NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

C&C Computers and Communications

NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

IN BRIEF

One more for the new year

Apple Computer, Inc. started the new year by corralling additional clout for developers with the acquisition of **Coral Software Corp.**, a Cambridge, Mass.-based purveyor of programming languages and artificial intelligence tools for Macintosh personal computers. Coral currently makes and markets two LISP product lines — Pear LISP, an entry-level development environment, and the more sophisticated Allegro Common LISP — as well as Object Logo, an object-oriented version of a programming language widely used in education.

Apple's acquisition includes not only the Coral technology but also five key software engineers around whom the new parent plans to develop a Cambridge-based research lab for its Advanced Technology Group.

. . . . . .

Is eight enough?

Ask venture capitalist Thomas J. Perkins. Already the chairman of seven publicly held companies including Tandem Computers, Inc. and Genentech, Inc., the **Kleiner Perkins Caufield & Byers** partner heads into the new year as chairman — the company's first — of **Alliant Computer Systems Corp.**, which hopes to harness his experience to renew its assault on the embattled minisupercomputer sector.

. . . . . .

Softech takes one giant step

Softech, Inc.'s recent purchase of Wakefield, Mass.-based **Compass, Inc.** from **Applied Data Research, Inc.** marked the Waltham, Mass.-based company's entry into the high-end compiler and professional services marketplace for supercomputers as well as its first giant step beyond the federal government services arena into the commercial marketplace. The deal also effectively placed Softech in the rarified group of contrarians who have acquired organizations from super-acquisitor and ADR parent firm **Computer Associates International, Inc.**

. . . . . .

Oracle keeps on spiraling

Oracle Corp. last week reported another quarter bound to disappoint those who speculated that the Belmont, Calif.-based database vendor could spiral no higher. Revenues for Oracle's second fiscal 1989 quarter ended Nov. 30, 1988 came in at $123.7 million — a 105% increase over last year's second-quarter sales. Net income rose 125% to $17.2 million.

Gandalf

CONTINUED FROM PAGE 63

million Canadian) in the fiscal year ended July 31, profits were just $7.9 million ($9.4 million Canadian). Gandalf made an unfriendly bid for the UK's CASE Group plc last January, which the target firm rejected.

Gandalf management has taken several steps to hold costs down. These include the November layoff of 90 U.S. workers and the shutdown of the assembly plant here.

In its new product strategy, Gandalf has had to reach beyond its usual arena of communications hardware to provide application software, electronic mail and other soft features. Inside the Starmaster cabinet, customers can assemble a combination file server and network node in a fashion similar to the creation of a stereo system from major components.

Testing, testing

Gandalf claims several large customers for Starmaster, including General Motors Corp.'s Electronic Data Systems Division in Detroit, but many early users are still evaluating the technology, Gunn said. One reason is that Starmaster attempts to support a wide variety of computer architectures while eliminating the need for a remote IBM 3274 cluster controller.

"We don't want to argue the esoteric issues of different architectures," Gunn said. "We're trying to bring performance improvements to all these environments.

"We're focusing on end users because we want to help them in planning their overall network design," Gunn added. But, he said, "We're not keeping the MIS people out of the loop."

The key to Gandalf's success in marketing its distributed file servers will be the degree to which they support open standards, according to Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. Until now, many of Gandalf's most successful products have been weighted toward the IBM environment.

"They'll have to recognize the nuances of the marketplace," Dzubeck said, "and right now, the drift in the marketplace is toward standards."

AT&T \ā-tē-ənd-tē\ *n* **1:** creator of the UNIX® Operating System **2:** developer of the foremost UNIX System training program **3:** the source of comprehensive training for the entire computer industry

AT&T defines computer training.

AT&T invented the UNIX Operating System, and no one else can teach you more about it. *But the UNIX System is just part of what AT&T can teach you about computers.* We offer a complete range of training programs, including 135 individual courses in five curriculums:

■ **UNIX System and C Language**—Up-to-date training in System V Release 3, including basic, intermediate, and advanced levels.

■ **Data Communications and Networking**—We'll help you get your computers talking to each other efficiently.

■ **Database Management**—Learn to design and manage a business database.

■ **Business Applications and Personal Computers**—Practical instruction, from word processing to spreadsheets.

■ **AT&T Computers**—We'll teach you to install, maintain, and operate our 3B product line.

You can learn from AT&T at professional training centers nationwide. Or we'll send our instructors right to you. We even offer low-cost videotape instruction that lets you train at your own pace and convenience.

You'll appreciate the quality of our training. Our AT&T instructors average at least a decade of experience. And classes are small, *just one student per terminal,* so you'll receive lots of valuable personal attention.

For *definitive* computer training, AT&T is the only right choice. Call or write now for course details.

AT&T COMPUTER TRAINING.
Come right to the source.
1-800-247-1212, ext. 221
Or send in the coupon below.

© 1988 AT&T

Registrar, AT&T Training, P.O. Box 45038, Jacksonville, FL 32232-9974

YES! I'd like to come right to the source for computer training. Please rush me more information about: ☐ Videotape Training in UNIX® System, C Language, and Shell Command Language

Or course descriptions and schedules for:
☐ UNIX System and C Language ☐ Database Management
☐ Data Communications and Networking ☐ AT&T 3B Computers
☐ Business Applications and Personal Computers

Name (Please print) _____
Title _____ Phone ( ) _____
Company _____
Address _____
City _____ State _____ Zip _____

CWU01099

AT&T
The right choice.

Hitachi beefs up U.S. presence

BY J. A. SAVAGE
CW STAFF

NORMAN, Okla. — If the oft-rumored sale of National Advanced Systems (NAS) to Hitachi Ltd. comes true, Hitachi will have a ready supply of U.S.-made storage peripherals available for the U.S. market.

Hitachi said recently it is more than doubling the size of its storage subsystems manufacturing plant here by the end of 1989. Hitachi is taking advantage of the dollar's weak position against the Japanese yen to manufacture more economically in the U.S.

The $10 million expansion of the year-old Hitachi Computer Products (America), Inc. facility is ramping up to produce 7380 JX and K direct-access storage device (DASD) subsystems for NAS mainframes.

Previously, NAS obtained those newest DASD models from Hitachi's main plant in Japan, according to a spokesman.

The lack of DASDs available for shipment was blamed in part for NAS' poor revenue in the quarter ending August 1988.

Prior to the December ramp-up of JXs and Ks, the plant supplied NAS with DASD Model Ds and Es.

Gruenfeld

CONTINUED FROM PAGE 63

is to set up a third-party escrow arrangement for the source code. Contract provisions specify those conditions under which the vendor will turn over the source code. Examples include failure to issue timely upgrades or inability to correct bugs.

Basically, the escrow agreement, like the entire license agreement, is considered to be an "executory contract." But under bankruptcy law, the trustee of the bankrupt company can simply reject an executory contract — and that is the end of the escrow agreement and the customer's rights to the source, no matter how diligently the customer may have complied with all the terms of the contract. No amount of contract language, no matter how clearly it expresses the intent of the vendor to turn over source code, can protect the customer.

The legal journals are filled with clever strategies created by frustrated attorneys to try to protect their clients from this occurrence. As stated above, the worst part is that there have been no actual test cases to use as models. Furthermore, the very right to even use the software itself is rarely dealt with.

The camel's back

The final straw prompting Congress to fix the problem was the case of *Lubrizol Enterprises* v. *Richmond Metal Finishers* in the 4th U.S. Circuit Court of Appeals.

Richmond had licensed a proprietary metal coating process to Lubrizol on a nonexclusive basis. After Richmond went bankrupt, it decided that it could increase the price of its coating process if it took away Lubrizol's rights to it.

Lubrizol had done nothing to violate its contract but, shockingly, the 4th Circuit allowed Richmond to reject the license agreement for no other reason than to increase the value of the technology to the bankrupt company's estate.

The implications for software escrows were profound. Here was a case where the customer (Lubrizol) already had the technology in hand, paid for it and now was prevented from using it.

The cavalry charges

Enter Sens. Dennis DeConcini (D-Ariz.) and Howell Heflin (D-Ala.) and the Intellectual Property Bankruptcy Protection Act of 1988. The act is actually an amendment to the Bankruptcy Code and is designed to address those situations where there is "an executory contract under which the debtor is a licensor of a right to intellectual property." Specifically, it is expected that software licenses will be considered executory for purposes of interpreting the code.

Essentially, the new rules give the customer two options in dealing with rejected licenses. The customer can either consider the contract to be terminated or retain his rights under the contract. In both cases, the licensee may make a claim for damages caused by the rejection.

The trustee of the bankrupt company will be prevented from interfering with the customer's right to obtain the source code (for example, from a third-party escrow holder) if that right was written into the software contract. Even better, the customer does not have to wait for the trustee to reject the contract but can request that the materials be turned over immediately.

It is good news indeed. But, as usual, things are not as simple as they sound. The new rules will require very carefully worded contracts to ensure that the desired effect is manifested. None of this has any impact on other problems of escrow arrangements such as the need to ensure that the source code actually matches the object code — a remarkably widespread and underestimated issue. The new rules open a great window of opportunity but are no cause for relaxation.

Gruenfeld, a management consulting partner in the Los Angeles office of Touche Ross & Co., specializes in strategic information systems planning.

WE'VE JUST ELIMINATED THE ONE MAN WHO'S STOOD BETWEEN YOU AND THE WORLD'S MOST POWERFUL EIS.

Introducing the EIS/Generation Series from Pilot: Full EIS capability without the big support bills.

Announcing EIS/G, the industry's first series of EIS code generators. This new technology can reduce your EIS development and support costs by up to 80%. And you won't need a programming staff to implement powerful EIS systems. Pilot's experience with leading corporations will also ensure that your executives will have proven and effective EIS functionality. Code generation means you can have it at a fraction of the overall cost.

Put EIS/G to the test. Call us at (617) 350-7035 to arrange a one hour demonstration at your office. We'll show you EIS in a different shade of green.

PILOT
EXECUTIVE SOFTWARE
40 Broad Street Boston, MA 02109

Charting MIS course by degrees

Master's in MIS programs offer professionals an alternative to MBA

BY JANET MASON
SPECIAL TO CW

The graduate degree of choice for most MIS professionals is an MBA with a concentration in information systems. An alternative is the master of computer science, but this degree more often lends itself to technical positions in the vendor community.

The new kid on the block is the master's degree in MIS, which is offered by only a dozen or so universities, far fewer than the ever-present MBA. Leaders of programs offering the master's in MIS say it was designed for people anticipating a relatively technical career track. In contrast, companies might seek MBA holders for positions in end-user departments in which they would know the work and could apply MIS expertise.

However, Mike Lawson, associate professor of economics and chairman of the MIS department at Boston University, notes that graduates of the university's 6-year-old graduate MIS program have been promoted to some management roles.

"Our graduates have already moved up to direct the MIS departments in small and medium-size organizations, and they have also advanced to high positions in consulting firms," Lawson says.

MIS managers, academics and recruiters agree that the question of which degree to pursue is not based on which is better but rather on fitting the proper academic background to one's career path.

Individuals with an MBA tend to land more lucrative posts than those with a master's in MIS. But Lawson says the choice of degrees should hinge on whether an individual wants the broad-based management outlook of the MBA or the more technical one of the master's in MIS.

MBAs wanted

Georgia Miller, assistant dean of the School of Business at Indiana University in Indianapolis, says that companies seeking to hire MIS employees with a broad business perspective for applications work or entry-level management positions favor MBAs. "Companies will hire MBAs when they are looking for future leaders of the company, because they tend to have more of a generalist background," Miller says.

Students joining the Indiana University MBA program on average have three to five years of experience in a general business function. "We feel that it is very important for students to have business experience outside of their field," Miller says. "MIS is not an area unto itself. The students have to relate it to the rest of the business."

Warren Harkness, MIS director at Bose Corp., a manufacturer of audio products in Framingham, Mass., says his company hires MBAs with five to 10 years in a consulting environment for the in-house business systems consulting group.

These MBAs try to identify solutions to business problems, then review the technical feasibility of the solutions and hand projects over to a technical person, Harkness says.

> "COMPANIES WILL hire MBAs when they are looking for future leaders of the company, because they tend to have more of a generalist background."
>
> GEORGIA MILLER
> INDIANA UNIVERSITY

Jim Young, managing director of recruitment firm Source EDP in Philadelphia, says his clients seeking employees with MBAs are generally management and computer consulting divisions of Big Eight accounting firms. "The ideal academic background [for these firms] is an undergraduate degree in computer science and then an MBA," he says.

Amy Peal, an analyst/programmer at Pennwalt Corp. in Philadelphia, began studying for her MBA in 1984. She says accounting and finance classes provide her with an understanding of end users' problems when designing systems in those areas.

"As an MBA candidate, I feel I have broader-based business knowledge that makes me more useful to my employer already," Peal says.

Few grad MIS programs

Boston University's Lawson estimates that there are currently fewer than a dozen graduate-level MIS programs in the country. "The career track in MIS is still developing," Lawson says. "Most universities are still trying to reconfigure their business programs to include MIS courses."

Boston University takes the novel approach of requiring candidates for master's in MIS to attend the program full-time for 11 months. The university also requires candidates to hold an undergraduate or graduate degree in business.

"It's important for our students to have a grounding in business," Lawson says. "Then when they enter the program, they take a core of business courses that focus on how MIS functions in those areas, along with specialized technical courses in MIS and management classes."

The master's in MIS program at the University of Arizona in Tucson is more technically oriented than Boston University's and is designed so that students can opt for a part-time or full-time schedule.

This degree is geared to positions in data administration, database design and networking, says Jay F. Nunamaker, director of the Arizona program. The greatest demand among organizations recruiting graduates is for telecommunications, Nunamaker adds.

In the Arizona program, students take a core of five business courses along with technical MIS courses. They can specialize in several areas, including analysis and design of databases and communications and networking, according to Nunamaker.

Lawson says he expects programs offering the master's in MIS to eventually spread to more campuses. "There's a large demand in MIS departments for people trained in the technical areas of the industry," he says.

Mason is a Philadelphia-based freelance journalist.

Moore Financial Group, Inc., a regional bank holding company in the Northwest located in Boise, Idaho, is seeking career-oriented professionals to assume key responsibilities in the development and support of check processing applications for its affiliates: Idaho First National Bank, Oregon First Bank, and Continental Bank of Utah.

Programmer/ Analyst

The successful candidate will be responsible for the development, testing, and implementation of the check processing applications and should have:

- at least 3 years experience in large-scale IBM OS/VS1 or MVS environment
- proficiency in COBOL, VSAM, CICS and OS/JCL, and Assembler
- CPCS experience desirable.

Qualified candidates will have a Bachelor's in Computer Science or related field, or possess equivalent work experience in programming/analysis.

Moore Financial Group, Inc. offers excellent salaries, benefits and career growth potential. For consideration, please submit resume, in confidence, to Mary Ockerse, Employee Relations & Staffing, P. O. Box 8247, Boise, ID 83733. An equal opportunity employer m/f/h. Principals only, please.

MOORE FINANCIAL GROUP

SYSTEMS SOFTWARE RESEARCH and DEVELOPMENT

CINCOM, Cincinnati, OH based, the world's largest privately held software firm has outstanding opportunities for Software Development Professionals at our Research and Development Center located in Cincinnati, OH.

Positions require a minimum of 3-5 years experience in the design and implementation of **IBM** mainframe, **VAX**, or **UNIX** systems software products; or systems programming experience with multiple operating systems. These positions require a strong working knowledge of **Assembler, Pascal** and/or **"C"**, in the **MVS/XA, VSE, VM/CMS, VMS, or UNIX** environments.

Positions are available for individuals with skills in one or more of the following areas:

- Unix systems, with experience in system administration and operation as well as Unix software development
- IMS DB/DC
- VAX/VMS and DECnet
- CICS, DB2, and SQL
- SNA and LU 6.2

Prior experience with Cincom products (**SUPRA, TIS, ULTRA, MANTIS**) or other Data Base/Data Communication, and **4GL** systems is a definite plus.

If a creative and challenging Sr. Software Engineer or Project Leader position is of interest to you, please forward your resume and salary history, in confidence, to:

World Headquarters
2300 Montana Avenue
Cincinnati, Ohio 45211
ATTN: Patti Swillinger, DH

CINCOM

An Equal Opportunity Employer

Do you consider yourself one of the best?

If so, you'll want to join Comp-u-Staff's elite staff of consultants. We're a division of a major publicly traded company and we've grown at an average rate of 50% over our 10 years in business! Comp-u-Staff consultants understand business issues, relate well with users and work in leading edge environments.

If you have good interpersonal skills and a minimum of 2 years industry experience in IDMS/ADSO, IMS, DB2 or CICS, we can offer you nationwide opportunities in the following areas:

EASTERN U.S.: Atlanta, Baltimore, Central Pennsylvania, Cleveland, Philadelphia, Pittsburgh, Wilmington, Washington, D.C.

MIDWEST: Minneapolis, St. Louis

WEST: Portland, Seattle

Special project opportunities are available in the Midwest for individuals with experience in INGRES, ORACLE, 1032, and TESSERACT.

Along with an excellent career path and training programs, we offer an outstanding compensation and benefits package. For consideration, send resume and salary requirements to: Carol Neilson, Comp-u-Staff, Inc., Corporate Headquarters, 1 Investment Place, Towson, MD 21204. Or call 1-800-626-8082.

We hire and promote equally

Comp-u-Staff
Just the right people.

ROBERT HALF

EDP OPPORTUNITIES COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 130 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. **All fees are paid by client companies, of course.** The following is a partial listing of opportunities and locations:

ST. LOUIS

DEC PROGRAMMER/ANALYST

Major Midwest corporation seeks an experienced DEC VAX COBOL Programmer/Analyst to help develop manufacturing applications. Will be heavily involved in the design, development, and implementation of a major manufacturing system. Great benefits. **$35,000**

IDMS/ADSO ANALYSTS AND PROGRAMMERS

Top-notch Midwest IBM shop has need for several experienced Analysts and Programmer/Analysts with 3+ years of IDMS and either ADSO or CICS. Will develop and support financial, distribution and manufacturing applications. Great benefits and excellent work environment. **$38,500**

TOTAL/SUPRA DATABASE ANALYST

Prestigious St. Louis based Fortune 500 corporation seeks an experienced TOTAL Database Analyst or Programmer/Analyst with heavy TOTAL application's background. This position will support TOTAL/Supra applications and eventually move to DB2. Great location. **$33,000**

ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

BOSTON

DEC VAX PROFESSIONALS

BOSTON area has numerous openings for VAX/VMS programmers, P/A's, and project leaders. Skills should include COBOL or FORTRAN, FMS, RMS, plus any exposure to RDB or DBMS-32. Industries include manufacturing, financial services, & high tech.
Salaries **$30-45,000**

ROBERT HALF
of Boston
101 Arch Street
(32 Summer Street)
Boston, MA 02110
(617) 951-4000
FAX (617) 423-0904

DALLAS

Multiple openings for people with the following: SMARTSTAR, CICS, ADABAS/NATURAL, RPGIII and other 4GL languages. For more information call us or dial (214) 987-1957 1200 BAUD to link up with our modem and view the ROBERT HALF EMPLOYMENT LOCATOR PROGRAM (RHELP), and just follow the instructions.

Alex Patton
Dick Ozment
ROBERT HALF
of Dallas
Three Northpark East, Suite 200
Dallas, TX 75231
(214) 363-3300

SOUTHERN CALIFORNIA

BEAUTIFUL SAN DIEGO

We have positions available for DBA's, VAX & IBM COBOL P/A's and Systems people. Many other great opportunities in San Diego, Orange County and Los Angeles.
Salaries range from **$36-55,000**

ROBERT HALF
of Southern California
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

PHILADELPHIA

TOTAL SR PROG/ANALYST

Full time consulting opportunity located in Central NJ. Experience using TOTAL data base with COBOL, Librarian, Environ, VM/CMS and DOS. Commission for new business. Salary to **$50,000**

ROBERT HALF INTERNATIONAL
2000 Market Street
Philadelphia, PA 19103
(215) 568-4580
FAX (215) 568-0772

ALBUQUERQUE

DATA COMMUNICATIONS

Expanding bank group. Requires 2 to 5 years Tandem exp, Guardian operating system. IBM data communication software a plus.
Start **$34,000**

Dick Starnes
ROBERT HALF
of New Mexico
P.O. Box 3320
Albuquerque, NM 87190

HARTFORD

RPG III

Several NEW ENGLAND clients seek people w/solid RPG III skills to help in conversions to AS 400's or application devel on System 38's. Desirable app's include: Mfg, Fin'l, Ins. Urban & rural loc's: reloc assistance avail.
Salary to **$40,000**

IDMS/ADSO/IMS DB/DC

Multiple EAST COAST oppty's for indiv w/2+ yrs exp w/IMS or IDMS. Excellent growth potential. CT/VA shoreline, VT/NH ski country and NY/NJ metro area openings. Call for more details. Salary **$30-44,000**

MFG SYSTEMS

NE oppty for indiv w/strong bkgrd in implmtng mfg syst's-MRP, invty ctl, purch, scheduling - outstanding oppty to impl latest sftwr in a dis DEC/VAX environ. APICS cert & good sys skills are pluses. ASK MANMAN soft exp also a plus!
Salary to **$48,000**

ROBERT HALF
of Hartford
One Commercial Plaza
Hartford, CT 06103
(203) 278-7170
FAX (203) 278-0320

FREE

Ask for our latest Salary Survey.

MANAGER, ADMINISTRATIVE SYSTEMS & PROGRAMMING
$43,304 - $53,593

Responsible for all Administrative Systems and Programming including Student Records, Fiscal Accounting Systems, and Payroll. This position reports to the Director, Data Processing. We use Hewlett Packard computers which were recently upgraded to a Series 950 (conversion is still underway) with a Model 58 supporting Library automation. We support over 200 workstations on two major campuses. We program in COBOL and are planning the implementation of 4GL and CASE.

The Manager supervises a staff of six and is responsible for data base integrity, technical and general supervision of his/her staff, and to act for the Director in his absence.

We require an appropriate four-year degree and three years related experience at the main-frame or mini-computer level. Micro-computer experience is helpful but will not meet the experience requirement.

PERSONNEL SERVICES
LONG BEACH CITY COLLEGE
4901 E. Carson Street
Long Beach, CA 90808
(213) 420-4391

COMPUTER SYSTEMS ANALYST II
JOB ANN#88-4545
$31,476-$34,702

Position available with the Wastewater Treatment Division, Dept. of Public Works. Monitors and operates the Coordinated Control, Monitoring and Alarm System (CCMAS) and the Data Collection and Reporting Computer (DCRC). Writes programs using Fortran 77, Assembly, and Advanced Basic computer language. Develops and redesigns programs. Develops and implements test procedures. Reqs: Equiv. education and experience to a bachelor's degree in computer science or a related field and one year of specialized writing computer process control instrumentation.

Apply by January 27, 1989.
Fairfax County application form is required. For information and application, call or write to:

FAIRFAX COUNTY
OFFICE OF PERSONNEL
4103 CHAIN BRIDGE RD.
FAIRFAX, VA 22030
(703) 385-HIRE
AN EOE/AA EMPLOYER

There's never been a better time to join us.

Systemhouse is one of the largest and fastest growing systems integrators in the industry. By applying leading technologies to information problems, we've delivered some of the most complex and successful systems solutions to our clients.

Our dynamic growth has created immediate opportunities for experienced and highly motivated professionals in the following areas:

SYSTEMS ARCHITECTS
TECHNICAL ANALYSTS
SYSTEMS ANALYSTS
SR. SYSTEMS ANALYSTS
PROGRAMMER ANALYSTS
SR. PROGRAMMER ANALYSTS
PROGRAMMERS

Requirements include a minimum of 1 year experience in one or more of the following:

IBM Mainframe — TANDEM

Also required is experience in one or more of the following:

DB2 — PATHWAY
CICS — TAL
NATURAL 2 — SQL
COBOL

Relocation and travel are required for all positions.

We offer a highly competitive compensation package including an extensive benefits plan.

For immediate consideration and to arrange an interview, send your résumé in confidence to: **Peg Gamse, Systemhouse, National Systems, Department CW-102, 1010 North Glebe Road, Arlington, VA 22201.** An Equal Opportunity Employer M/F/H/V.

SYSTEMHOUSE

Programmer

Are You The *BASIC* Person We're Looking For?

You are, if you have extensive experience programming in AlphaBasic, or a similar multi-user BASIC language in a manufacturing environment. We're Alpha Microsystems, a world leader in the design and manufacture of high performance, multi-user microcomputer systems.

We're looking for an innovative, self-directed individual with at least 3 years experience in designing and programming business applications, accounting and MRP. Expertise in Alpha Micro, Data General or DEC systems is particularly desirable. A Computer Science or related degree is preferred.

Alpha Microsystems rewards your contributions with an excellent salary and benefits package. You'll also enjoy our progressive, growth-oriented environment. If this position sounds BASICally right for you, send your resume and salary history to:

MIS Staffing
ALPHA MICROSYSTEMS
RIGHT FROM THE START
3501 Sunflower
Santa Ana, CA 92704

PRINCIPALS ONLY
Equal Opportunity Employer

ADA ENGINEERS
MILITARY DEVELOPMENT
OVERSEAS CONTRACT ASSIGNMENTS

Trident's European branch based in Holland has urgent long-term assignments available for professional Engineers to be based in Madrid, Spain. Excellent rates and package.

Specific expertise in the following areas required—

- **5 years' S/W development experience in ADA**
- **Must have worked in a Military environment**
- **Background in modern methodology**
- **Experience with Software tools**

Please send your resume to:

Trident Computer Services Inc.
33 Boston Post Road
Suite 250
Marlborough, Massachusetts 01752
or phone 1-800-344-4827

TRIDENT
COMPUTER SERVICES INC.

Attention Programmers

Why with all the ads in this publication no wonder you're confused about which one to answer.

For 10 years, I've specialized exclusively in placing programmer analysts & systems programmers in large IBM shops throughout the nation.

Companies today are more selective than ever. That's why it would be in your best interest to contact an agency that avoids mass mailings & gives your career top priority. Send resume to Robert Montgomery or call 919-787-4205 • FAX #919-787-4703.

The Data Group
P.O. Box 52055
Raleigh, NC 27612

DP OPPORTUNITIES

P/A's COBOL/CICS/IMS ..to $40K
S/A's COBOL/CICS/IMS ..to $45K
SYS. PROG. CICS.....to $45K
SYS. PROG. MVS.....to $45K

Call Sherry Ramsey

THE COMPUTER CONNECTION
(919) 227-5806
P.O. Box 824
Graham, NC 27253

UNISYS 1100

Permanent positions for software professionals.

MAPPER Analysts
COBOL Programmers
DMS/TIP Analysts
EXEC Internalists
TELCON Support

Call collect or send resume to:

COMPUTER STAFFING
10061 Talbert Avenue
Fountain Valley, Calif. 92708
(714) 964-2822

O'BRIEN & COMPANY
Executive Search

APPLICATIONS DEVELOPMENT PROGRAMMER/ANALYSTS

TWIN CITIES & NATIONAL OPPORTUNITIES

IMS DB/DC	DB2
SAS	MAPPER
4GL	IDMS/ADSO
ADR DATACOM/IDEAL	

Banking, Transportation, Finance Direct Mail and Consulting Environments

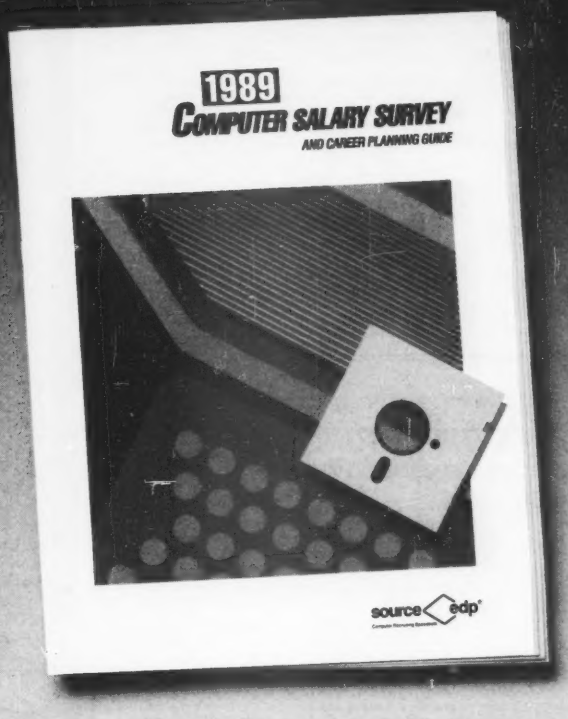
All Fees Paid. Re-Lo Benefits.
Call or write: **JOHN O'BRIEN**
O'BRIEN & COMPANY 300 E. Fourth Street, Saint Paul, MN 55101, (612) 290-0003

Are You Keeping Up with the Latest Salary Increases?

- Growth trends and which computer careers offer the most salary and career potential
- How to assess your current position
- What you can do to avoid career dead-ending
- The 1989 "going rates" for professionals at different experience and skill levels
- The six steps to computer management

The 1989 Survey will give you a totally new perspective on where careers will head this year and in the future.

To get your free copy of the **1989 Computer Salary Survey and Career Planning Guide**, contact Source. Source Edp is the leading recruitment firm that specializes exclusively in the computer profession.



Call the Office Nearest You this Week—Ask for Extension 10

Call and ask for extension 10. Or, write to the address below. Either way, we'll send your copy without charge or obligation.

UNITED STATES:

Alabama
Birmingham 205/322-8745

Arizona
Phoenix 602/224-0014
Tucson 602/792-0375

Arkansas
Little Rock 501/372-2620

California
Northern
Mountain View 415/988-4910
Sacramento 916/446-3470
San Francisco 415/434-2410
San Mateo 415/969-4910
Silicon Valley 408/737-2424
Walnut Creek 415/945-1910

Southern
Fullerton 714/738-1313
Irvine 714/660-1666
Downtown 213/688-0041
San Fernando Vly. 818/905-1500
South Bay 213/540-7500
Torrance 213/323-6633
West 213/203-8111
San Diego 619/573-0100

Colorado
Colorado Springs 719/632-1717
Englewood 303/773-3700

Connecticut
Danbury 203/797-0590
Hartford 203/522-6590
Meriden 203/235-8642
New Haven 203/787-4585
Stamford 203/967-4888
Trumbull 203/375-7240
Waterbury 203/574-5633

Delaware
Wilmington 302/652-0933

District of Columbia
Washington D.C. 202/293-9255

Florida
Fort Lauderdale 305/763-2107
Jacksonville 904/356-1820
Melbourne 305/725-3095
N. Miami Beach 305/940-1014
Orlando 305/282-9455
Pinellas 813/443-6490
Tampa 813/222-0007

Georgia
Atlanta/Perimtr.-400 ..... 404/255-2945

Illinois
Chicago/Loop 312/372-1900
Oakbrook Terrace 312/953-9500
Peoria 309/673-0274
Rolling Meadows 312/392-0244

Indiana
Fort Wayne 219/432-7333
Indianapolis 317/631-2900

Iowa
Des Moines 515/243-0191

Kansas
Overland Park 913/888-8885
Topeka 913/232-6722
Wichita 316/688-1621

Kentucky
Louisville 502/581-9900

Louisiana
Metairie 504/561-6000
Shreveport 318/222-6188

Maryland
Baltimore 301/727-4050
Columbia 301/730-6833
Greenbelt 301/441-8700
Rockville 301/258-8800
Towson 301/321-7044

Massachusetts
Boston 617/439-6240
Braintree 617/849-3556
Burlington 617/273-5160
Springfield 413/739-4083
Wellesley 617/237-3120
Westborough 508/870-0426

Michigan
Detroit 313/259-7607
Grand Rapids 616/459-6539
Lansing 517/484-4561
Southfield 313/352-6520
Troy 313/362-0070

Minnesota
Bloomington 612/835-5100
Minneapolis 612/332-6460
St. Paul 612/227-6100

Missouri
Clayton 314/862-3900
Kansas City 816/474-3383
St. Louis, Westport 314/576-4444

Nebraska
Omaha 402/346-0709

New Hampshire
Nashua 603/888-7650
Salem 603/893-7311

New Jersey
Atlantic City 609/345-2444
Cherry Hill 609/488-5400
Clifton 201/473-5400
Edison 201/494-2800
Freehold 201/431-2332
Morristown 201/267-3222
Paramus 201/845-3900
Princeton 609/452-7277
Somerset 201/469-9444

New Mexico
Albuquerque 505/247-4270

New York
Liverpool 1-800-777-JOBS, x10
Buffalo 716/855-0400
New York City
Grand Central 212/557-3611
Penn Station 212/736-7445
Wall Street 212/962-8000
Rochester 716/263-2670
Syosset, L.I. 516/364-0900
White Plains 914/428-9100

North Carolina
Charlotte 704/358-1820
Greensboro 919/379-1155
Raleigh 919/847-7605

Ohio
Akron 216/535-1150
Beachwood 216/292-6190
Cincinnati 513/651-3303
Cleveland 216/771-2070
Columbus 614/224-0660
Dayton 513/461-4680
Toledo 419/242-2501

Oklahoma
Oklahoma City 405/722-7410
Tulsa 918/599-7700

Oregon
Portland 503/223-6160

Pennsylvania
Allentown 215/776-0524
Camp Hill 717/761-8790
Harrisburg 717/761-8790
King of Prussia 215/341-1960
Philadelphia 215/665-1717
Pittsburgh 412/261-6540
Reading 215/374-4230

Rhode Island
Providence 401/751-0065

South Carolina
Columbia 803/256-7446
Greenville 803/271-7044

Tennessee
Chattanooga 615/265-8890
Memphis 901/525-0743
Nashville 615/256-0625

Texas
Austin 512/472-0100
Dallas
Central 214/954-1100
North 214/387-1600
El Paso 915/532-6316
Fort Worth 817/338-9300
Houston
Downtown 713/751-0100
Galleria 713/439-0550
San Antonio 512/659-0100

Utah
Salt Lake City 801/986-3900

Virginia
McLean 703/790-5610

Washington
Seattle 206/454-5420
Spokane 509/838-7677

Wisconsin
Green Bay 414/432-1184
Madison 608/251-0104
Milwaukee 414/475-7200
Milwaukee 414/287-1188

CANADA:

Alberta
Calgary 403/279-1940
Edmonton 403/459-1153

British Columbia
Vancouver 604/222-1155

Manitoba
Winnipeg 204/942-1151

Ontario
Mississauga 416/848-3344
Toronto 416/591-1110
Willowdale 416/495-1551

source edp®
Computer Recruiting Specialists

Source Edp, P.O. Box 7571, Department 1IK1, San Mateo, CA 94403-7571.
If you write to request a copy, please include your position title.

At Crestar Bank, We've Just Welcomed The Year 2000

While everybody else has just been saying "Happy New Year," Crestar Bank is doing something about it. We've created outstanding opportunities for experienced Data Processing Professionals at our state-of-the-art Operations Center in Richmond, Virginia. Always ahead of the times, Crestar's IBM 3090 MVS/XA mainframe environment is one of the Southeast's premier data processing installations — and coming soon, our new MVS/ESA!

Crestar Bank is a progressive, profitable and growing financial institution in the economically stable Virginia, Washington,D.C. and Maryland markets. We currently have challenges available for:

- DATA BASE ADMINISTRATORS
- PROGRAMMERS
- SYSTEMS ANALYSTS
- PROGRAMMER ANALYSTS
- MVS SYSTEMS PROGRAMMERS
- DASD SYSTEMS PROGRAMMERS

In addition to working in a highly professional, advanced environment, you could be enjoying life in Richmond. Named one of the most "liveable places" in America, our city offers a variety of lifestyles, with excellent nightlife and cultural amenities. Located near the mountains, the seashore, and our nation's capital, Richmond also has a four-season climate making it a great place for outdoor enthusiasts.

If you're wondering what Data Processing opportunities may look like in the year 2000, you'll want to explore Crestar Bank, now! We offer competitive salaries and comprehensive benefits. For consideration, send your resume to: Personnel Officer-30, Crestar Bank, P.O. Box 26150, Richmond, VA 23260.

CRESTAR

An Equal Opportunity Employer M/F

Data Processing

CAREER OPPORTUNITIES

at MIDAMERICAN COMMUNICATIONS CORPORATION

PROGRAMMERS

MidAmerican Communications Corporation, headquartered in Omaha, Nebraska, is a completely digital long distance carrier specializing in voice, data, fax and video products and services.

Our rapidly growing MIS Department, located in Omaha, currently has a number of openings for experienced Programmers.

Preferred candidates for our Programmer positions should possess a minimum of two years programming experience in Prime Information Database, Pick Database, or PL/1.

MidAmerican offers a competitive salary commensurate with experience, and a comprehensive benefits package. If you like challenging work in a dynamic environment and have the above qualifications, send your resume in complete confidence to: **Human Resources, Administrator/MIS121, MidAmerican Communications Corporation, 2918 North 72nd Street, Omaha, NE 68134.**

MIDAMERICAN COMMUNICATIONS CORPORATION

equal opportunity employer

Board of Governors of State Colleges and Universities

Data Processing

DIRECTOR COOPERATIVE COMPUTER CENTER

The Cooperative Computer Center serves the administrative data processing needs of three Board of Governors institutions: Chicago State University, Governors State University, and Northeastern Illinois University. Resources include a staff of 70, an IBM 4381 Model P14 computer supporting several RJE stations, MVS, and CICS/VS, application software from Information Associates and McCormack and Dodge.

The Director is responsible for all administrative computing, developing long-range ADP plans, preparing operating budgets, recruiting staff and ensuring that the universities receive timely and accurate management information.

Minimum academic qualification is a bachelors degree; an advanced degree in computer science or a related field is preferred. In addition, candidates should possess significant technical and administrative experience related to the management of an administrative computer center.

Candidates must be able to establish effective working relationships both with senior executives and technical personnel and be sensitive to the varying information needs and political considerations within a university cooperative.

Starting annual salary will be competitive depending upon experience.

Send resume and references by January 31, 1989 to:

Dr. William H. Lienemann
Chairman, CCC Director Search Committee
Cooperative Computer Center
190 Prospect
Elmhurst, IL 60126

An equal opportunity/affirmative action M/F employer

IBM & DEC POSITIONS

Salaries from $28 to $50,000 dependent on experience

Rapidly growing southeastern consulting firm has immediate openings for Programmer Analysts with 2+ years experience in ADABAS/NATURAL, in a IBM or DEC environment.

We are also seeking individuals with proven DEC VAX, FORTRAN skills to work with process control and factory automation systems.

Additionally, we are looking for candidates with IMS, CICS, COBAL, DB2, and a strong banking/financial background for local NC clients.

Both permanent positions and contract assignments available. Contact:

Cindy Labell

DataMasters™

P.O. Box 14548
Dept. CW-CP
Greensboro, N.C.
27415-4548
or call collect
(919) 373-1461
FAX (919) 373-1501

EG&G Idaho, Inc., the prime operating contractor for the Department of Energy's National Engineering Laboratory (INEL) has openings for the following Engineers:

SOFTWARE ENGINEERS

Candidates should have 2-5 years experience in software development, experience with requirements analysis and experience with UNIX and C. Desirable traits include database and artificial intelligence backgrounds and familiarity with structured development methodologies.

SYSTEM DIAGNOSTIC ENGINEER

Define system diagnostic requirements, survey commercial products, plan, develop & integrate sytem diagnostic tools. Candidates should have skills similar to the above position.

DISTRIBUTED DATABASE SOFTWARE ENGINEER

Responsible for the design and development of the application/database distribution software. Candidate shall provide technical leadership, technical interface and client technical interface. Senior technical experience, systems level design experience, C, ORACLE, SQL, and UNIX experience (or equivalent) are required.

SOFTWARE QUALITY ASSURANCE ENGINEER

Candidates should have 2-5 years experience in software testing and V&V. Experience with C, ORACLE, SQL, and UNIX highly desirable.

Idaho Falls is located in the heart of the country's most scenic recreational areas. If interested and qualified, please submit resume with salary history, in confidence to: **Employment Services, (TB-95), EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, Idaho 83415-3127.** We are an equal opportunity employer M/F/H/V. U.S. Citizenship required.

Unix is a trademark of AT&T

EG&G Idaho, Inc.

TANDEM

SOFTWARE ENGINEERING OPPORTUNITIES

Technical Specialist. A hands-on position requiring 5-7 years software development in Tandem environment. You must be an expert in Data and Telecommunications: X25, SNA, SNAX, HLS, CMI, Guardian internals, SYSGENS and design. Prior manufacturing or EDI experience would be a plus.

Sr. Systems Engineer. Responsible for project level activities such as design planning, programming, installation, tuning and systems management. Measure, XRAY, TMF, COBOL, SCOBOL & TAL.

Software Engineer. Design and programming in an on-line environment. COBOL, SCOBOL, DDL, TML, ENFORM, C, SQL, UNIX is a plus.

We provide an excellent compensation and benefits package. For more information call collect (313) 879-7600 or mail/fax your resume in confidence to:

MERIT SYSTEMS, INC.

TONY FAHMIE
MERIT SYSTEMS, INC.
National Headquarters
5800 Crooks Rd., Ste. 200-S19
Troy, MI 48098
FAX (313) 879-9075

Prog/Analyst, DBAs Perm Positions — FT to $85K — NY, NJ, Conn.

all skills welcome, especially:

CICS IMS
SYS 36/38
HP-3000
UNIX/C
TANDEM
IDMS SUN
STRATUS VAX

Merlin, 101 W31, NYC 10001
BRETT (212) 714-2555

PROGRAMMERS

Contract Assignments
$25-30 Per Hr.+

The Need to Succeed

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, "C," ASSEMBLER, PL-1, etc.). Contract assignments 12 mos. + $25-30/hr. + benefits package. *In confidence, contact Al Madsen, CEC.*

CORPORATE PERSONNEL CONSULTANTS, INC.
3705 Latrobe Drive, Suite 310
Charlotte, NC 28211
(704) 366-1800

SENIOR CONSULTANTS AND PROGRAMMERS

CW Systems Inc., is a leading consulting firm specializing in custom software development projects using the latest information engineering techniques in state-of-the-art environments. We are currently seeking successful Senior Consultants and Programmers experienced with large development projects in highly visible environments. We offer top compensation including project bonuses, profit sharing and a competitive benefit plan. If you have proven skills in the following areas:

- DB2
- CSP
- SQL/DS
- MODEL 204
- ADABAS/NATURAL
- CICS/STRUCTURED DESIGN

Please call and/or send your resume to:

CW Systems Inc.

600 Congress Ave Suite 2760 Austin, TX 78701 (512) 469-0245	2925 Brierpark Suite 830 Houston, TX 77042 (713)781-7468	15951 Dallas Pkwy Suite 675 Dallas, TX 75248 (214) 450-5815

COMPUTER SCIENCE TEACHING OPPORTUNITIES

Tenure track positions in the Department of Quantitative Methods and Computer Science (QM/CS), Fall, 1989. Qualifications: PhD or Masters with teaching experience and/or substantial industrial experience. Capable of teaching in 2 or more graduate/undergraduate areas; software quality assurance, metrics, and testing; productivity tools/CASE/4GLS; distributed DB, structured systems analysis & design; real-time applications; software engineering; data modeling, and information analysis techniques; strategic information systems planning/managing the information resources; supercomputers. Must be competent to teach a wide variety of courses including applied statistics and several languages such as BASIC, FORTRAN, PASCAL, COBOL, ADA, C. The normal teaching load is 3 courses each semester (approx. 9-12 class hours per week). This individual must be willing to advise undergraduate students, contribute toward departmental curriculum development, assume responsibilities for some department functions, perform some research, and contribute toward the College's Liberal Arts environment. The College of St. Thomas is a Catholic liberal arts college with an undergraduate day school and evening school, and Masters in: Business Administration, Business Communication, Manufacturing Systems Engineering, International Management, Education, and Software Design and Development. The College of St. Thomas is located midway between St. Paul and Minneapolis along the Mississippi River and is the largest private university in Minnesota. It has a total enrollment of approximately 8800 students. Send resume (before 2/1/89) to: Dr. B. Folz, Department of QM/CS, College of St. Thomas, 2115 Summit Ave., St. Paul, MN 55105.

SOFTWARE DEVELOPERS

As a nationwide placement firm specializing in UNIX system developers, programmers, and software engineers, Innovative Options can help you explore positions throughout the national high tech, R&D community.

Our nationwide clientele and network of affiliates can offer challenging opportunities (without cost to you) in any of the following areas:

- UNIX/C
- VAX
- Applications or Systems Development
- Networking/Telecommunications
- Database Development

Prefer BS, MS, or PhD in Computer Science or EE. No entry level positions available. Send your resume in confidence to:

INNOVATIVE OPTIONS

P.O. Box 21560 • Columbus, OH 43221 • (614) 457-8383

UNIX is a Trademark of Bell Labs

Software Design & Development, Inc.

The UNIX® Specialists

Software Engineers
*We Need Your Experience**
Unix/C
VMS/C
Telephony and Database
Call or send Resume for immediate response
454 South Anderson Rd
BTC Suite 120
Rock Hill, SC 29730
1-800-634-8086

*2 years minimum experience

OPERATIONS RESEARCH ENGINEER required. Design and development of mathematical programming, network optimization algorithms and computer simulation models in aircraft operations area. The models are designed to allow operations to proceed efficiently despite irregular disturbances or disruptions caused by minor and major factors such as equipment failure, severe weather, etc.

Applicants required to have Masters degree in Operations Research and at least two years optimization algorithms and computer simulation model experience. Applicants experience must demonstrate two years prior experience in the design and creation of mathematical optimization algorithms and operational computer simulation models.

Annual Salary will be $40,000/year for a 40-hour work week. Additional Salary up to $50,000/year may be paid if education and experience warrant.

Interested applicants apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 5515263. This advertisement was paid by an Equal Opportunity Employer.

SYS/38 - CALIF

SANTA BARBARA COTTAGE HOSPITAL, a 600-bed acute care facility, has immediate opportunities for an IBM SYSTEM/38 PROGRAMMER/ANALYST. The installation is running BAXTER hospital software on two SYS/38's (Models 600 & 700) and is planning to migrate to the AS/400. The applicant must have at least 3 years experience programming in RPG III on a SYS/38. Health care and "PC" experience would be advantageous. Salary commensurate with experience. Choice benefits, superb working environment, unmatched geographic location and a commitment to state-of-the-art technology are offered. Applications will be accepted until 1/23/89. Please send resume and salary requirements to:

HUMAN RESOURCES DEPT., 2400 Bath Street, Santa Barbara, CA 93105, (806) 569-7212. EOE.

DB2/ADABAS TECHNICAL SUPPORT

Worldwide vendor of ADABAS and DB2 utility software has tech support openings at headquarters in the Seattle, Washington area. Excellent compensation and benefits. Dynamic, informal working atmosphere.

Provide tech support to prospects, clients and international distributors via phone, FAX, telex. Participate in quality assurance. Interface with product development and marketing staffs.

Requirements: excellent analytical and communication skills; training and experience in DB2 and ADABAS; strong working knowledge of MVS facilities, JCL, TSO. Familiarity with CICS, IMS-DC, BAL helpful.

Send resume to: DataBase Utility Group, Inc., P.O. Box 4129, Federal Way, WA 98063.

Analyst for Administrative Computing

Information and Computing Services

Kenyon College

KENYON COLLEGE, a small private liberal arts college with an enrollment of approximately 1,500 students, is accepting applications for an Analyst Programmer for Administrative Computing. Kenyon College is a nationally recognized leading academic institution.

The primary duties and responsibilities are related to new and existing computer applications within college offices, including

a. maintenance support of existing systems.
b. research into new applications.
c. design of applications.
d. implementation.
e. training of office personnel.
f. evaluation and documentation.

Desired qualifications include a bachelor's degree, prior experience as a programmer analyst, and strong oral/written communications skills. Familiarity with a college environment, POISE Data Management System and VAX BASIC are also desirable. Review of applications will begin January 20, 1989, although applications will be accepted until the position is filled.

Send resume and three letters of recommendation to:

Mr. William Siders, Chair
Administrative Analyst Search Committee
Kenyon College
Wing Administrative Computer Center
Gambier, OH 43022
(614) 427-5664

Kenyon is an equal opportunity employer, women and minorities encouraged to apply.

DATA PROCESSING PROFESSIONALS

Join one of the fastest growing consulting firms in the Southeast! Overwhelming demand has created new openings in the areas serviced by our NASHVILLE, TN; CHARLOTTE, NC; COLUMBIA, SC and ATLANTA, GA offices in the following areas:

- **CICS, DL/1**
- **Natural Adabas**
- **Q or L Clearance**
- **VAX, Cluster Sys Mgr**
- **DB2 or Datacom DB**
- **Vax/PDP Fortran w/Database**
- **IDMS, ADS/O, Cullinet Mfg.**
- **Dec, Oracle, Ingres or RdB**
- **Basis**
- **Tech Writer, Scientif. or Eng. Doc.**

We offer excellent salaries and benefits. Call or send resume to our Corporate Office TODAY!

AMERICAN COMPUTER PROFESSIONALS
P.O. Box 5125
Columbia, SC 29250
(800) 332-0555
equal opportunity employer

Software Engineering Manager

The Florida Legislative Data Center seeks an individual to manage its Software Engineering Bureau. The position requires senior level project management experience in developing new application systems and upgrading existing ones.

Applicants must have an extensive DP background in an IBM 308X environment and possess good supervisory as well as excellent written and verbal communication skills. Knowledge of MVS/XA, CICS, ADABAS/NATURAL, ATMS, STAIRS, DISOSS, TOKEN-RING LAN and OA products is desirable.

Requirements include a BA degree from an accredited college or university plus 5 years of progressively responsible MIS experience, or any combination of education and experience totalling 9 years. The Florida Legislature offers competitive compensation ar an excellent fringe benefits package. Please send cover letter with resume including salary history to:

Mr. J. R. Langley, Director
Florida Legislative Data Center
Room 94, Holland Building
Tallahassee, Florida 32399-1400

SYSTEMS PROGRAMMERS ASSEMBLER VM OR MVS

(TPF EXPERIENCE A PLUS)

We're Computer Horizons, one of the country's premiere data processing services companies with sales exceeding $80 million and a highly successful network of 31 offices around the country. With a firm commitment to create expert solutions for our major Fortune 500 clients. If you're an advanced systems thinker, ready to make your mark on new-age technology, join us at CHC.

We are currently staffing three new projects in Arizona, California and Connecticut that will prove both interesting and challenging to experienced systems programmers. If selected, you will become part of a select group of systems professionals providing: enhancement, changes, upgrades and modifications to the TPF operating system. Depending on your level of experience you will either:

a. code, enhance and add new functions to the TPF operating system, as well as provide needed customer support.
b. learn TPF and become a part of the support team providing modification and enhancements.

To qualify, we will accept several levels of experience and provide the necessary training or skills upgrading.

ANY ONE OF THE FOLLOWING:

1) SYSTEMS PROGRAMMERS WITH 1 TO 3 YEARS EXPERIENCE IN TPF (ANY IBM OPERATING SYSTEM INTERNALS EXPERIENCE ALSO OKAY). WORKING KNOWLEDGE OF COMMUNICATION PROTOCOLS (SNA; S.25 a +; VTAM a +). DASD FILE MANAGEMENT EXPERIENCE, OR
2) SYSTEMS PROGRAMMERS WITH 1 TO 3 YEARS OF MVS OR VM SYSTEM EXPERIENCE, OR
3) SYSTEMS PROGRAMMERS WITH ASSEMBLER AND SOME OPERATING SYSTEM INTERNALS EXPERIENCE (WE WILL TRAIN), OR
4) IBM ASSEMBLER APPLICATIONS PROGRAMMERS THAT WANT TO LEARN ANY OF THE ABOVE

These positions are located in Arizona, California or Connecticut. If selected, we offer above average salaries, a complete benefits package that includes health, life, dental and disability insurance, unlimited tuition refund, as well as our deferred income savings plan 401K, relocation assistance and the chance to secure your future in an established, growing leader in the technological industry. Please respond by calling or sending resume to:

For Connecticut positions contact John Moultrie
40 Richards Avenue
Norwalk, CT 06856
(203) 855-3040

For Arizona and California positions contact Richard Rauchbach
225 West Broadway
Suite 475
Glendale, CA 91204
(818) 502-1263

COMPUTER HORIZONS CORP.

"The Solution Experts"
An Equal Opportunity Employer M/F

Data Processing

SYSTEMS PROGRAMMERS/ APPLICATION DEVELOPERS

IBM®

The challenges of meeting the information needs of IBM customers are more exciting and rewarding than ever before.

If you have strong technical and personal communication skills, and the ability to assume responsibility for results in a customer environment, you could qualify for a position requiring project leadership, systems architecture, systems development, or systems programming skills with IBM Systems Integration Division. Openings are available in Minneapolis, Milwaukee, Omaha, Des Moines, or Denver. Candidates must have at least 4 years experience in several of the following areas:

- **Data Communications/Data Base Management Systems (CICS, IMS, CSP, DB2 or QMF/SQL)**
- **Systems Programming (MVS/XA, MVS/SP or VM/XA)**
- **Network Communications Products (VTAM/NCP, IBM Token Ring, PC-LAN or AS/400 Networking)**
- **Systems Planning and Design (CASE, JAD or BSP experience)**
- **Industry Expertise (Finance, Insurance, Distribution or Manufacturing)**

Investigate excellent compensation, benefits and career prospects at IBM Systems Integration Division. Please send your resume, indicating geographic preference, in confidence, to: **IBM Corporation, Central Employment, SID, 222 S. Ninth Street, Suite 290, Minneapolis, MN 55402.**

An equal opportunity employer

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced Computer pros with background in any of the following: IBM Cobol mainframe applications; CICS; IDMS; IMS; ADABAS; ORACLE; DB 2; FOCUS; ADR DATACOM; SAS; VM/CMS; S/38 RPGIII or COBOL; DEC/VAX COBOL or FORTRAN; HP3000; Series 1; Financial; Mfg.; Banking; Insurance; MSA; Point of Sale; MVS, VM, NCP/VTAM or CICS Systems Progrs; DEC/VAX Systems Mgrs; Database Analysts; Method 1 or similar methodology. Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3924 Browning Pl., Suite 7
Raleigh, NC 27609
(919) 782-3024

Faculty Positions

Computer Science Department

One or more full-time graduate faculty positions starting September, 1989, or January, 1990. Teaching and working with Graduate students in Artificial Intelligence, Data Communications, Software Engineering, and Systems Programming. Required: doctorate (or all but dissertation) in computer science or related area, college teaching experience, and research accomplishments. Rank and salary dependent on qualifications. Summer teaching and excellent fringes. Send inquiries, vita (including three references) by March 15, 1989, to Dr. Don Henderson, Computer Science Department, Mankato State University, Box 225, Mankato, MN 56002. An EO/AAE.

Farm&Home Savings Association

DATA PROCESSING OPPORTUNITIES

Research & Development Security Analyst

Farm & Home Savings, a successful $3.6 billion savings and loan located in Nevada, MO, is seeking a Research & Development Analyst, with primary responsibilities of analysis, research, and coordination of departmental processing applications, such as accounting systems, etc.

Qualified candidate must have experience in an IBM environment and PC to mainframe experience. Strong projects background with an emphasis on computer security. Prefer financial institutions background. Require good written and verbal communication skills.

We offer an outstanding compensation and benefits package as well as opportunities for professional growth. For consideration, please send your resume to:

Human Resources Department
Farm & Home Savings Association
221 W. Cherry
Nevada, MO 64772
EQUAL OPPORTUNITY EMPLOYER

DATA PROCESSING MANAGER

Alternative Transportation Systems Group, a specialized group of transportation organizations consisting of the following operating companies:

- **Area Interstate Trucking, Inc.**
- **Area Transportation Company**
- **Roll and Hold Warehousing and Distribution**
- **Western Intermodal Services, LTD.**

Seeks a professional D.P. Manager to fill vacancy created by retiree.

Position requires a minimum of 7 years "hands-on" experience coupled with full technical knowledge of IBM SYS/36 using RPG II and OCL. Transportation, inventory and financial applications background desired. Excellent opportunity for a self-motivated individual to manage a staff of three Programmers as well as program, design and implement data processing systems. Position reports directly to V.P., Finance.

We offer an excellent salary and benefits plan. For confidential consideration, forward resume with salary history, to: **ATS GROUP, Personnel Department, 935 W. 175th Street, Homewood, IL 60430.**

Alternative Transportation Systems Group

Avg. Temp 72

FLORIDA CONNECTION

DP OPPORTUNITIES

Telephony (CABS)	To 50K
DBA IMS DB2 M204	To 45K
LAN UNIX C	To 37K
Tandem Cobol	To 30K
MVS IDMS Cobol	To 38K
DB2 IMS CICS	To 37K
MVS PL1 IMS CICS	To 39K
UNIX C Informix	To 37K
VAX Fortran DBMS	To 35K
IMS/DL1 CICS	To 37K
IMS DB/DC Cobol	To 38K

Call Russell Bray, CPC
AVAILABILITY, INC.
Dept. C, P.O. Box 25434
Tampa, Florida 33622
813/286-8800
FAX: 813/286-0574

DEC $34,000
Well established software firm seeks Programmer/Analyst. PDP, RSTS/E, BASIC+2. Co will relocate.

S/A $50,000
Fortune 100 co seeks Systems Analyst. IBM 38, RPG III. Degree a plus. Co will relocate.

ROBERT HALF
DATA PROCESSING
#1470
Houston, Texas 77056
800/356-1994

ATLANTA & SOUTHEAST

$25,000 to $75,000

IDMS/ORACLE/DATACOM/IMS/DB2/SYS 38
VAX/MAPICS/FOCUS/CAD/CAM/CAE
TECHWRITERS/DP SALES/IDMS

Need Programmers, Programmer Analysts for Full-Time and Consulting Positions in IBM Shops. Relocation Expenses Paid. Send resume to:

Jim Heard, EDP Consultants, Inc.
3067 Bunker Hill Road, Suite 202
Marietta, Georgia 30062

FAX: 404-973-4052
PHONE: 404-971-7281

K E A N E

CHALLENGE

How has Keane grown more than 60% in the last year to become a $60M applications software company? By making a difference to its Fortune 1000 clients, and providing to its employees opportunities for technical challenge and professional development.

We are currently seeking experienced programmers and programmer analysts with a minimum of two years of COBOL plus one or more of the following: IDMS, IMS, CICS, DB2, TELON, DATACOM, VAX, 4GL's, ADABAS, MARK IV, PL1, IBM PC, PACBASE, SYS/38, AS/400.

Opportunities exist in Bedford, MA, Boston & Lexington, MA, Columbia, MD, Meriden & Stamford, CT, Minneapolis & Rochester, MN, New Providence, NJ, Portland, ME, Providence, RI, Wayne, PA, Chicago, IL.

Add challenge, growth and success to your career. For more information on positions at any Keane location, call Deborah Pawlicki at 1-800-328-4688, or send a resume (in confidence) to her attention at Keane, Inc., Parkview Suite 250, 10480 Little Patuxent Parkway, Columbia, MD 21044.

KEANE

MAKING THE DIFFERENCE

An equal opportunity employer

QUALITY ASSURANCE MANAGER

The primary duties of the QA Manager are the establishment and maintenance of standards governing the migration of applications from the test environment into the production environment and the support of production applications. A SCCS will be established and maintained.

The minimum requirements are six years of experience and a BS in Computer Science or a closely related field.

The operating environment includes an IBM 3084Q (MVS-XA) supporting 125 peripherals and a TCP/IP network hosted by four NCR Tower's (UNIX 5.3) supporting 140 peripherals.

Starting annual salary is $30,793 with benefits package.

Applications will be accepted through January 27, 1989.

Bernalillo County
Personnel Department
Attn: QA Manager
One Civic Plaza
Albuquerque, NM 87102

STATE-OF-THE-ART SHOPS
100'S DP OPPORTUNITIES

CICS – P/A's, MVS or DOS	$21-36K
CICS or DB2 – Mfg. Appl., Cobol	$28-40K
IMS DB/DC – P/A's	$27-35K
IDMS-ADS/O – P/A's	$29-36K
ADABAS/NATL – P/A's	$28-35K
Bank – IBM or Burr P/A's	$29-38K
Ins. – ALC, LIFE COM, LIFE 70	$30-42K
MSA – P/A's, G.L. or Payroll	$33-40K
PL1 – P/A's	$29-38K
McCormick & Dodge P/A's	$38-42K
ORACLE	$30-38K
Dec Vax – RDB	$27-35K
FOCUS – VM/CMS	$29-35K
IDEAL, Datacom	$27-35K
Sys 38 – P/A's RPG III or Cobol	$27-35K
Sys 36 – S/A's, RPG III, JCD Ed	$33-40K
MAPICS, RPG II, RPG III, P/A's	$27-36K
HP 3000, Cobol Cognos	$27-35K
HP 3000, Cobol ASK MANMAN	$27-38K
UNIVAC 1100 P/A's Mapper	$28-35K
DB 2 – P/A's SQL	$28-40K
Sys. Prog. MVS/XA, NCP, VTAM	$38-48K
Data Base Anal's, IMS or IDMS	$40-48K

Major Co.'s seeking confident promotable, D.P. Professionals w/ 2+ yrs. work expr. Locations: So., S.E., Many Carolina's & Nationwide. Ask for our Free Resume Guide. Attn: T. Smith, D.P. Spec. (504) 295-1240

BADON'S DP Div.
5837 GALERIA, BATON ROUGE, LA 70816
"Interviews & Fee's Paid by Client Co.'s"

"Computerworld works for us."

Roger Fraumann is Staff Director for Lachman Associates, Inc. (LAI) of Westmont, Illinois, one of the largest privately held computer systems software consulting and development firms in the United States. When he needs qualified people to fill positions as the company grows, he turns to *Computerworld*.

"*Computerworld* is the only national publication that we routinely advertise in," says Roger. "Simply put, *Computerworld* delivers just what we're looking for: top-quality job applicants."

To find out how *Computerworld* can work for you, call John Corrigan, Recruitment Advertising Sales Director, at (800) 343-6474 today.

ANNOUNCING A NEW POSITION
Information System Coordinator
for
A Major Southwestern County Government

Maricopa County, which includes the Phoenix Arizona metropolitan area, is searching for the right individual to coordinate a major strategic restructuring of the County's Information Systems organization. The successful candidate will work with the managers of the County's six functional information systems centers to produce and maintain a comprehensive County-wide long range information systems program. This key staff position will provide technical advice and staff support to the Board of Supervisors, the County Information Systems Steering Committee and the County Manager. He/she will also have responsibility for coordinating and compiling the annual budget requests required to implement the program. In addition, the Information Systems Coordinator will implement County-wide policy, and recommend procedures and standards for data processing.

Maricopa County has 11,000 employees and a $1 billion budget. The County is a dynamic growing organization with a "can do" attitude toward problem solving. Phoenix offers a sophisticated urban environment with numerous cultural amenities. Sports enthusiasts can watch professional football and basketball, play golf on over 70 public courses or take advantage of the close by recreational resources that offer hunting, fishing and winter sports. Attractive housing prices, excellent schools and an ideal climate make Maricopa County a great place to raise a family.

This challenging staff position requires demonstrated success in the management of a large budget, multi-faceted, highly visible data processing organization. Public sector experience is very desirable. Candidates should excel in all communications skills - listening, speaking and writing. Strong negotiation and facilitation skills are mandatory. Creativity, innovation and a broad perspective of the technology available are also required. Success in this position will require high integrity and the ability to promote trust and cooperation between the diverse functional elements of the County. The County is very interested in finding the right individual who will make a long term commitment to the County and this position. The salary range is $75K to $85K and includes an excellent benefits package.

If you meet the criteria above and you would be challenged and rewarded by a staff position of this scope please send your resume' by February 15 to:

Weber & Weber
Department MC
1275 Market Street
Suite 1300
San Francisco, California 94103

Maricopa County is an Equal Opportunity Employer.

SYSTEMS PROGRAMMER

Supporting the ability of our 400+ bed regional referral hospital to provide quality, state-of-the-art health care is a staff of talented Information Systems professionals. To round out this dedicated team, we need an experienced Systems Programmer capable of installing, maintaining, and trouble-shooting all software and hardware including VM, VSE, CICS, VSAM, DL/I, VTAM and IBM 4381-23, 3370, 3380, and 3480.

If you have a degree in computer science and at least 2 years experience as a VM/VSE Systems Programmer, pursue this opportunity with Welborn Baptist Hospital in Southwest Indiana. Expect excellent benefits and a salary that reflects your experience. Send resume in confidence to: Karen Dunlap, 401 S.E. Sixth St., Evansville, IN 47713. (812) 426-8135.

WELBORN Baptist Hospital

An Equal Opportunity Employer M/F/H

EATON

IBM SYSTEM 38 PROGRAMMER

RESPONSIBILITIES:
- Analyze new program requirements
- Design, code, test and debug programs
- Provide documentation for new applications
- Provide user education and support
- Monitor and operate the system

REQUIREMENTS:
- Working knowledge of languages and utilities: SDA, RPG III, CLP, SEU
- Two years experience on System 38 required
- College degree and manufacturing a plus

Our Fortune 200 Company offers a competitive salary structure and benefits package. For consideration please forward your resume and salary history confidentially to:

Pamela Green
Human Resource Manager
EATON CORPORATION
Semiconductor Equipment Division
2433 Ruttand Drive
Austin, Texas 78758
EOE

DP PROFESSIONALS

Positions available in Southeast and Nationwide.

Competitive Salaries

- IBM CICS, DB2 COBOL
- IBM IMS DB/DC, FOCUS
- IDMS, ADSO
- ADR IDEAL
- SAS, MODEL 204, PL/1
- ADABAS/NATURAL
- ORACLE
- RPG III, SYS 38
- VAX/VMS, C, COBOL
- PC COBOL/DBASE III
- TANDEM P/A's
- HOGAN TDA/DDA/MLS
- FLORIDA SOFTWARE
- FOCUS/TRAMIS
- BURROUGHS, GEMCOS
- MSA
- PACBASE/IMS

INFORMATION MGT. INC.
1 CORPORATE DR. SUITE 325
CLEARWATER, FL 34622
1-800-626-1117
1-813-577-1738

COMPUTER SYSTEMS ENGINEER - Analysis design and development of database and software systems involving latest technologies such as bar coding and electronic data interchange and maintenance and upgrading of hardware systems. BS (Engg) & MS (Computer Based Info Systems) and 1 yr. exp. or 1 yr. exp. as Electrical Engineer required. Academic background must include at least 1 semester of each of the following: Data Base Management, Data Networks. 40 hrs/wk; 9 a.m. - 5 p.m., $30,000/yr. Send resume to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 78588. Employer pd. ad.

Publications Supervisor

The Florida Legislative Data Center seeks an individual to supervise its Photocomposition and Document Publication Section. The position requires good managerial and supervisory skills, thorough familiarity with mainframe and PC based typesetting technology, general text processing and DP experience, and excellent written and verbal communication skills. Knowledge of IBM ATMS-III, OS/MVS, VERSACOMP and VENTURA PUBLISHER is desirable.

Applicants are required to have a BA degree from an accredited college or university plus 5 years of progressively responsible experience, or any combination of education and experience totalling 9 years. The Florida Legislature offers competitive compensation and an excellent fringe benefits package. Please send cover letter with resume including salary history to:

Mr. J. R. Langley, Director
Florida Legislative Data Center
Room 94, Holland Building
Tallahassee, Florida 32399-1400

A Terrific Opportunity

Computer Consulting Group, one of the Southeast's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking:

DEC/ORACLE
VM/CMS/COBOL
IDMS/ADSO
VAX/FORTRAN
PDP/RSX
VAX/RDB
HP/TRANSACT
WANG/COBOL

Computer Consulting Group
Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd.
Suite 207
Raleigh, NC 27609
1-800-222-1273

How to place your recruitment ad in Computerworld's Computer Careers section:

It's easy. All the information you need is right here. Just fill out the form and send it in. Or call Lisa McGrath at (800) 343-6474 (in MA, (508) 879-0700). (You can even fax the form to us at (508) 620-7739).

Rates:

☐ $9 per line one region ($126 per column inch)

☐ East/West ☐ East/Mid-West ☐ Mid-West/West

☐ $11.60 per line for two regions ($162.40 per column inch)

☐ East/Midwest ☐ Midwest/West ☐ East/West

☐ $13.50 per line national edition ($189.00 per column inch)

To reserve space, you need to call (800) 343-6474 by 5PM (all continental U.S. time zones) 5 days prior to the Monday issue. We need your ad materials (or the information in your ad by telephone) by 5PM the next day. Blind Box charges are $25 (US) and $50 (Foreign)

Copy:

We'll typeset your ad at no extra charge. Please attach clean, typewritten copy. Figure about 25 words to a column inch, not including headlines. Minimum ad size is 2 column inches. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Issue Date(s) - issued every Monday: _____

Name: _____

Title: _____

Company: _____

Address: _____

_____

_____

Telephone: _____

COMPUTERWORLD
CLASSIFIED ADVERTISING
Box 9171
Framingham, MA 01701-9171

Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only $39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48

* U.S. Only. Canada $110, Central/South America $135, Europe $195 (Airmail), all other countries $295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government — State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other
   - 95. Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 19. Vice President, Asst. VP
   - 21. Dir., Mgr., Suprv., IS/MIS/DP Services
   - 22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
   - 23. Dir., Mgr., Suprv., Analyst, of Systems
   - 31. Dir., Mgr., Suprv., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 38. Data Comm. Network/Systems Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President/Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales/Mktg. Mgt.

   OTHER PROFESSIONALS
   - 60. Consulting Mgt.
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educators, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

E4902-9

Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only $39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business Basic Rate: $48

* U.S. Only. Canada $110, Central/South America $135, Europe $195 (Airmail), all other countries $295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government — State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other
   - 95. Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 19. Vice President, Asst. VP
   - 21. Dir., Mgr., Suprv., IS/MIS/DP Services
   - 22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
   - 23. Dir., Mgr., Suprv., Analyst, of Systems
   - 31. Dir., Mgr., Suprv., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 38. Data Comm. Network/Systems Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President/Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales/Mktg. Mgt.

   OTHER PROFESSIONALS
   - 60. Consulting Mgt.
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educators, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

E4902-9

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

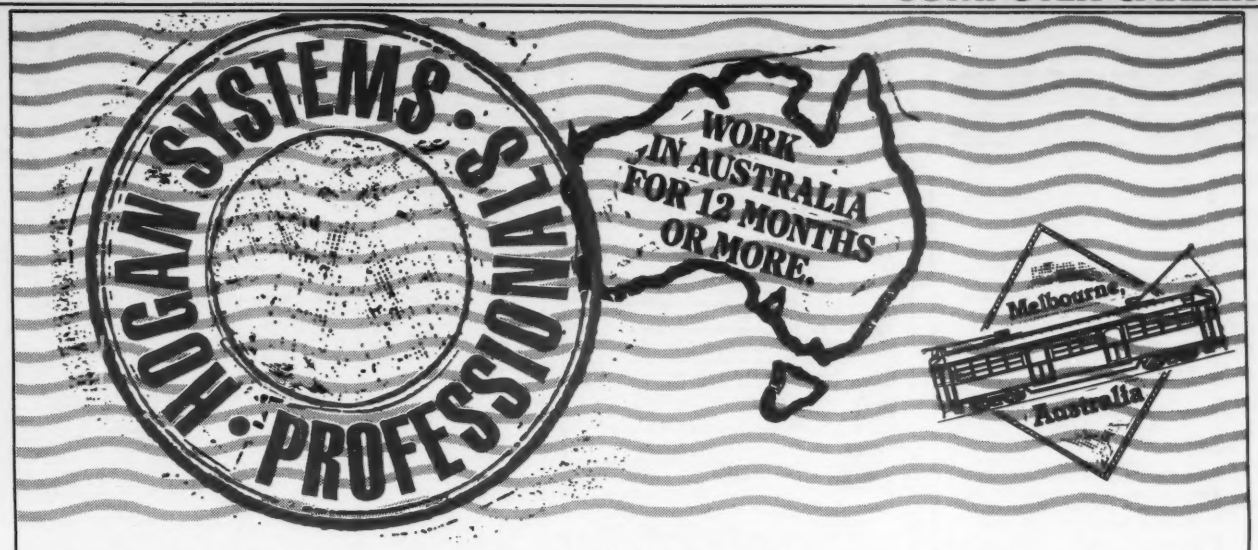
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



Are you available immediately for a 12 to 24 month assignment in Melbourne, Australia?

The ANZ Banking Group is one of Australia's largest financial institutions and is recognised as a leader in banking systems technology both in Australia and internationally.

The Hogan Banking Package has been adopted as the global core banking system and the Group now urgently requires suitably qualified and experienced Hogan Banking Systems Professionals to assist in the implementation of this major initiative.

We'd like to hear from genuine prospective personnel who are prepared to spend a minimum of twelve months or more working on this project at the bank's Melbourne headquarters. We require a minimum of four years "hands on" Hogan experience and in addition would welcome personnel whose skills include UMBRELLA, CIS, DDA/TDA, LOANS. All applications from Programmers through to System Analysts and Project Managers will be considered.

A return economy airfare will be provided by the Group together with two weeks "settling in" accommodation. Visa formalities will be expedited through our personnel department.

Interviews will be conducted at several strategic centres throughout the U.S. during the two weeks commencing February 6th, 1989. Detailed resumes of all interested applicants must be submitted to the U.S. address below no later than January 20, 1989. Home telephone numbers should be included in the information forwarded together with any relevant personal details to assist us in evaluating your suitability and to arrange interviews with you in the U.S. All applications will be acknowledged.

Melbourne is Australia's leading financial city and offers a lifestyle second to none in this fabulous sunburnt country.

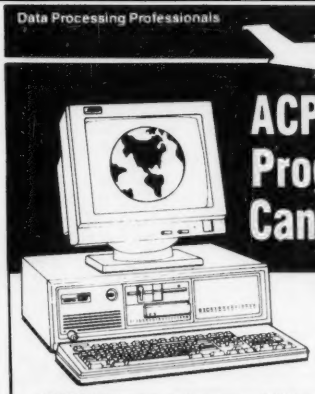
With a population of 3.5 million, Melbourne is regarded as Sydney's more elegant and sophisticated sister and is to Sydney what San Francisco is to Los Angeles. The city has magnificent sporting facilities to satisfy the most avid sports person and has an international reputation rivalling Paris for its restaurants and bistros. The weather is Mediterranean with average yearly temperature of around 70°F. Australians are extremely outgoing and friendly and enjoy a quality of life comparable to the best in the world.

Why not spend some time with us? Send your detailed Curriculum Vitae and accompanying personal letter to: Mr. John Stapleton, Regional General Manager, Administration and Operations, ANZ Bank, 7th Floor. 120 Wall Street, N.Y., N.Y. 10005. Tel. (212) 820 9800.

ANZ Bank is an Equal Opportunity Employer

ANZ Bank

Data Processing Professionals



ACP/TPF Programmers Can we talk?

ACP/TPF Programmers, if you are an IBM Assembler or SABRETALK programmer, we can. We can talk about PARS Service (Programmed Airline Reservation System), our dynamic, growth-oriented company. We can talk about how two of the country's most successful airlines merged their computerized reservation systems to form PARS Service...and how PARS recently joined with GEMINI system of Canada to form the largest multi-hosted CRS system in the world. Then we can talk about how a job with us can take you places, professionally and personally.

PARS SERVICE provides state-of-the-art computerized reservation service to TWA, Northwest, Air Canada and Canadian Airlines. We also develop and improve products for the travel agency industry.

Take off in your career and enjoy worldwide travel privileges on both airlines. We have comprehensive benefits, including:

- **Competitive salaries**
- **Hiring bonus**
- **Professional/technical training**
- **Non-contributory health insurance**
- **Relocation expenses**

We're situated in the charming City of Fountains — Kansas City — one of the most livable spots in America, ranked 18th in per capita income and 12th in educational achievement.

Curious? Let us tell you more about who PARS Service is, and how we can offer you a world of opportunities. Send your resume to:

Staffing Department
PARS Service Partnership
P.O. Box 20045
Kansas City, MO 64195
1-800-833-PARS
As. for Extention PARS

Equal Opportunity Employer

PARS SERVICE
THE INFORMATION SYSTEM THAT SPANS THE WORLD

Management & Systems Consultants

If you want to make the most of your career, go for the company that gives you the most opportunity. The most respect. And the most encouragement. As the #1 supplier and developer of software in the world, Computer Associates has the size and strength to offer you unlimited career potential. Along with the kind of caring environment that makes CA a place where you'll **want** to spend your career.

LOOK OUT FOR #1

Currently, we're seeking several sophisticated professionals to join us as we expand our Management Consulting practice into all phases of data center planning and project management. To get in on the ground floor of this spectacular opportunity, you must have experience in one or more of the following areas:

- **Converting DOS, Honeywell, Burroughs, or Sperry data centers to MVS**
- **Performing data center capacity planning, audits, and strategic planning.**
- **Handling DOS and MVS operating system installations and performance analysis**
- **Undertaking storage management performance and needs analysis in an MVS environment**
- **Creating and conducting formal training classes for programmers, operators and technical support personnel in an MVS environment**

In addition to the above qualifications, you must have a minimum of 8 years' practical data processing experience in a progressive environment, along with a strong understanding of basic MIS organizational concepts. An area of specialization related to any of the above categories would be a definite plus.

As a CA associate, we'll give you #1 treatment with a competitive salary, unusually generous benefits, and the kind of growth potential you can only get with a growing industry leader. For immediate consideration, please send resume to: **Computer Associates International, Inc., Personnel Department, 909 Las Colinas Boulevard East, Irving, TX 75039. (214)556-7183.** Equal Opportunity Employer m/f/v/h.

BY JOINING #1

COMPUTER ASSOCIATES
Software superior by design.

SENIOR DIRECTOR

Internal Consulting Group

If You're A Systems Innovator, Problem Solver and Leader, Your BEST Career Move Is To SCT.

Systems & Computer Technology Corp. boasts more than 20 years of leadership in providing advanced systems and software products to clients in higher education and government. Our latest products and service offerings have received broad market acceptance and we continue to show strength and vitality in all areas of our business.

We currently have a vital need for a seasoned professional to assume the responsibilities of Sr. Director for one of our key consulting groups. Your assignments will require nationwide travel, providing overall direction and high level systems expertise within a wide variety of technical environments.

The position requires a thorough knowledge of IBM VS/VSE and a proven history/ability of managing a large Data Center. "Hands-on" experience installing system software and interfacing with high level client and corporate management is also a must.

SCT can provide a competitive compensation package commensurate with your experience and aspirations, a full range of benefits and the opportunity to excel with a national leader. Qualified applicants should send a resume with salary history/requirements to: Recruiting Manager, SCT, Great Valley Corp. Center, 4 Country View Road, Malvern, PA 19355. (800) 441-7247. EOE

SCT

CIM SALES

Anyone Can Imagine The Future Only A Few Can Create It!

Merit Systems is a software professional services organization, providing the highest standards in customized software solutions to our clients. We owe our success to experienced account executives who create opportunity and who understand what it takes to "meet the challenge". To meet the growth we are experiencing, we're seeking aggressive, enthusiastic sales professionals who:

- **Possess successful account management experience.**
- **Can focus clearly on individual client requirements**
- **Have the ability to sell clients on Merit's custom solutions.**
- **Understand the evolving marketplace.**

Experience in the highly competitive manufacturing sales environment is absolutely required. You must be creative and self-confident with a consistent record of top performance. We'll match those talents with an excellent compensation package.

Call or send your resume in confidence to:

TONY FAHMIE
MERIT SYSTEMS, INC.
5800 Crooks Road, Suite 200
Troy, MI 48098
(313) 879-7600
FAX (313) 879-9076

MERIT SYSTEMS, INC.

RSVP SERVICES

* ANALYSTS • PROGRAMMERS
SOFTWARE/HARDWARE

Multiply Your Opportunities

With a network of over 1000 client companies and 200 affiliate employment agents nationwide, RSVP can selectively communicate your credentials to companies offering literally hundreds of choice, current career opportunities, clear across the nation.

We guide, You decide

Our no-obligation, no-pressure employment services to degreed, experienced U.S. citizens and permanent residents include resume development and interview arrangement. If you qualify, call Howard Levin or Maureen McCue at 800-222-0153, or send your resume to either address listed below by mail, or to FAX #609-667-2606. Our client companies pay all costs.

RSVP SERVICES
One Cherry Hill Mall, Ste. 514, Dept. C, Cherry Hill, NJ 08002
Dublin Hall, Suite 201, Dept. C, 1777 Walton Rd.
Blue Bell, PA 19422 *(Mail address only)*
Member Firm
computer net
national placement network

LEARDATA has been a leader in consulting services in the Southwest since 1978, and is still growing! The reason for our success?

INTEGRITY

We offer the true DP Professional challenging assignments; competitive compensation, including paid overtime; and a comprehensive benefit package. Hourly contract positions are also available.

You will need proven experience with any of these skills:

- TANDEM - Pathway, TAL or SNAX
- IMS DB/DC
- DB2/SQL
- TELON
- Relational database
- ADABAS/Natural
- ADFII
- Model 204
- Datacom DB/IDEAL
- PL/I, REXX
- SW Engin/ Networking

Call or send resume with location preference to David Bourbonnais at:

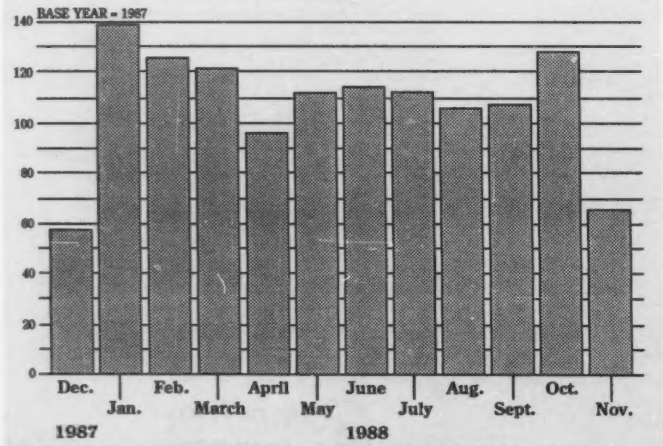
LEARDATA Info-Services, Inc.

600 N. Pearl, Suite 900, Dallas, TX 75201
214/969-7300

Offices In Dallas, Denver, Houston, Tulsa, Phoenix

CAREER INDEX

Computer recruitment advertising index*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE

System Software Engineer

Please send resume within 30 days of publication date to:
EMPLOYMENT SECURITY DEPARTMENT
ES Division, Att: AEC # 107040k
Olympia, Washington 98504

JOB DESCRIPTION: System Software Engineer, OS/2 Group. Designs, implements, and tests complex and high level systems and software for microcomputers and processors. Works with other engineers to design and modify aspects of the OS/2 operating system to run software to control mechanical operations, utilizing 8086 Assembler Series and "C" languages. Will work with IBM PC/AT computer. Designs device drivers with the capacity to run applications software to control several different mechanical tasks simultaneously. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules.

REQUIREMENTS: B.S. in Mechanical Engineering. Computer software design or programming: 6 months' work experience utilizing OS/2 or MS-DOS operating system, 8086 Assembler Series and "C" languages, and IBM PC/AT computers, and designing single user, multi-tasking operating systems with device drivers to run applications software to control multi-concurrent operations.

SALARY: $29,000 per annum. 40 hours per week, flex time.

POSITION LOCATED IN REDMOND, WASHINGTON.

EOE

CONTRACT PROGRAMMERS
WITH A MINIMUM OF 4 YRS EXP.

Up to $35 per hour

IMS/DB/DC
SQL, DB2, ADF
TELON, IDEAL
ADR/DATACOM
ADABAS/NATURAL
IDMS/ADS/O/CICS
MSA EXPERT
PRIME 9000
INFO/BASIC
IBM SYSTEM 38
UNISYS, ADA
FORTRAN, GKS
DEC, VAX
PDP-11, FMS

* Permanent and Contract Positions available *

* FOCUS w/Computer Science Degree OK/TX *

* Systems Programmer * DOS/VSE Hou. * Data General *

* Numerical Control Programmer *

We have openings in CA, TX, LA, MO, OK, IL, OH, MI, NC, VA, and West VA.

J.P.S. INC.
P.O. Box 690007
Houston, TX 77269-0007
(713) 820-0024
Fax (713) 251-5904

No trainees or part-time positions

Equal Opportunity Employer

System Software Engineer, Int'l Product Group

Please send resume within 30 days of publication date to:
EMPLOYMENT SECURITY DEPARTMENT
ES Division, Att: AEC # 99297-K
Olympia, Washington 98504

JOB DESCRIPTION: System Software Engineer, International Product Group. Designs, implements, and tests complex and high level systems and software for microcomputers and processors. Works with other engineers to design and localize applications software for sale in Sweden for MS-DOS operating system. Designs and adapts user education software for sale in Sweden. Will work with IBM PC/AT computer. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules.

REQUIREMENTS: B.A. or B.S. in Mathematics, Computer Science, Engineering or Physics. Computer software design or programming: 6 months' employment experience localizing applications software including user education materials and utilizing MS-DOS operating system and IBM PC/AT computer. Must read, write and speak Swedish and English fluently. Must be familiar with current colloquialisms, idioms and jargon as used in Sweden, especially as pertains to business usage.

SALARY: $29,000 per annum. 40 hours per week, flex time.

POSITION LOCATED IN REDMOND, WASHINGTON.

EOE

SAN DIEGO
Programmer Analyst II (2 Openings)

The exciting and progressive Information Systems organization at the University of California, San Diego, is seeking two experienced Programmer/Analysts who would be involved with payroll/personnel, or student, information systems.

You could be part of a large IBM installation using MVS/XA with Cullinet IDMS/R and IBM DB2, plus COBOL using structured programming techniques. Job requirements include IBM/MVS file handling and utilities with TSO, JCL and JES2, plus experience with IDMS, ADS/O or DB2 and CICS.

The University of California offers excellent benefits and salary growth with a starting salary of $30,800. To apply, send your resume to: **UCSD, Personnel, Torrey Pines Center, 10280 North Torrey Pines Road, S-022, La Jolla, CA 92093, by 1/20/89 and reference Job # 20375. AA/EOE.**

SOFTWARE ENGINEER: Design, develop & modify microprocessor based software control & display algorithms contained in automotive production microcomputers. Will interpret software specifications necessary & develop necessary control software using development tools such as vehicle simulator, software development instruments, time-sharing option operating systems & development cars using bit level implementation of high level algorithms. Requires M.S. degree in Electrical Engineering. Education to include completion of graduate research project in microprocessor system design & bit-level implementation of high level algorithm & completion of one graduate course in microprogramming & small computer organization & one course in advanced microprocessor system design. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $2,925.00 per month salary. Please send resume with social security number to: Indiana State Employment & Training Services, 10 North Senate Avenue, Indianapolis, Indiana 46204, Attention: W. F. Shepherd, I.D. 3180344, An Employer Paid Ad.

FROSTBURG STATE UNIVERSITY
SIS ANALYST/ PROGRAMMER

Full-time position to provide professional/technical support as liaison between the Office of Computing Services and the offices of Registrar, Admissions, Billing and Financial Aid. Bachelor's degree with COBOL proficiency and minimum two years' experience working for a college/university with computerized student information systems, preferably Information Associates, required. Ability to work with non-Computing Services personnel in a professional capacity necessary. VAX/VMS experience preferred. Salary range $18,658 - $29,979. Send letter of application, resume and the names, addresses and telephone numbers of three references knowledgeable of related work or educational experience, not later than February 10, 1989, to: Mr. C. Douglas Schmidt, Director of Personnel Services, Frostburg State University, Frostburg, MD 21532. AA/EOE.

S/38 - AS/400

Dunhill of Albuquerque is concerned about YOU! We care about your personal priorities as well as your professional development. This personalized attention has made us the leading national placement specialists for IBM S38 professionals since 1961. Today, with numerous clients going to the AS400, the demand for programmers and programmer/analysts with 1+ years of experience has never been greater. Using your skills, our marketing knowledge, and the Dunhill System of 300 offices nationwide, we can work together to attain your goals. Call or rush a resume to Deanna Gee.

DUNHILL OF ALBUQUERQUE, INC.
1717 Louisiana NE, Ste. 218C
Albuquerque, NM 87110
(506) 262-1871
Never a Fee to a Candidate

COMPUTER ENGINEER- IBM

Tokyo-based IBM computer dealer is seeking an additional experienced engineer, capable of installing upgrades on IBM GSD/DPD equipment throughout Japan.

Successful candidate will be based in Tokyo and travel extensively; knowledge of the language is helpful but not necessary.

Excellent benefits, competitive salary and fringe benefits. Send resume, in confidence to:

IBM ENGINEER
c/o PARK MESA VILLAS
550 PAULARINO #N208
COSTA MESA, CA 92626

MAINE - NH

We have specialized in data processing professional placement in Maine & NH for a quarter of a century. If you qualify for positions in the $25,000-$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC
Att: Dept. 2
P.O. Box 7040DTS
Portland, ME 04112
(207)773-4749

Computer Services: Senior Systems Analyst to begin March 1, 1989. Responsible for analysis, design, and development of new software systems and enhancements to existing systems. Provides technical assistance to the Systems Analyst. Bachelor's Degree required in Data Processing, Computer Science, Math, or related area. Four years experience COBOL programming, including two years systems analyst experience. Salary dependent upon qualifications and experience. Send letter of application, resume, and three work references: by February 10, 1989 to Susan Robinson, Missouri Western State College, 4525 Downs Drive, St. Joseph, Missouri 64507. An Equal Opportunity Employer.

Computer Systems Analyst wanted to analyze complex financial, banking and industrial systems requirements; design, develop, and customize financial, banking application systems on UNISYS Large systems (A15, A9) B4900 using DMS II, COMS, COBOL, ALGOL and Port software from Honeywell to UNISYS Large systems; Requires Bachelor's degree in Industrial Engineering, Electrical Engineering or Computer Engineering and two years experience; $39,600.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, Michigan 48202. Ref. #80488 "Employer Paid Ad"

IMMEDIATE OPENINGS

Assembler Prgmr	$35,000
ADABAS/NATURAL	to 62,000
IMS DB/DC or M204	50,000
DB2, SQL	40,000
System 38 (RPGIII)	32,500
FOCUS or NOMAD	30/hour
ADR/Datacom	40,000
CICS, other comm	39,000
Consulting	100,000
Contractors	to 75/hour
DB Administrators	to 69,000
EDP Auditing	40,000
Software Engineers	60,000

THE LESLIE CORPORATION
400 E Sam Houston Pkwy S 701
Houston, TX 77060
(713) 591-0915

The Leslie Corporation is a national and international recruiting organization, with offices across the U.S. All fees are paid by our clients.

MIS DP OPENINGS
Salary $25,000-$65,000

PROFESSIONAL PERSONNEL ASSOCIATES, INC. is seeking PROFESSIONALS to fill positions as Systems & Programmer Analysts, Engineers, and Managers in the following areas:

- IDMS, ADS/O, CICS, COBOL
- UNIX/C
- IBM S/36, 38, & AS/400 (RPG II & III), 4381, CSP/MVS
- IMS DB/DC, DB2
- DEC VAX, VMS, JCL

Please call or send resume to: Amanda McMahan

PROFESSIONAL PERSONNEL ASSOCIATES, INC.
5527 Monroe Road
Charlotte, NC 28212
(704) 532-5200
FAX: (704) 532-5210

SOFTWARE ENGINEER - R&D in Data Comm. $2,916/mo. BS in CS/CE. Must be proficient in MS C, 80386 Assembly. Advanced data compression & encryption algorithms. MS-DOS & OS-DOS, optical disk/DAT device drivers, XMODEM req'd. Send resume to 2535 West 237th St., Suite 101, Torrance, CA 90505. Attn: Sean.

Call to place your ad today
(800) 343-6474
(508) 879-0700

Vaccines are no miracle cure

Treatments for viruses could be hazardous to your computer's health

BY RICHARD PASTORE
CW STAFF

In the aftermath of November's Internet virus attack, vaccines claiming to detect and cure various types of computer infections have proliferated. An antiviral package vendor reports of a fellow who travels in a mobile home, going on-site to hunt down viruses and administer inoculations in the style of Hollywood's *Ghostbusters*.

As helpful as the vaccines may appear, some industry watchdogs and organizations are condemning some of the products as ineffective and potentially harmful.

Del Jones, managing director of the National LAN Laboratory in Reston, Va., has issued a set of guidelines on virus prevention and control endorsed by about 70 manufacturers [CW, Dec. 12]. "The guidelines specifically exclude vaccines because of the false sense of security they provide," Jones explains. "Once you throw in a vaccine, there's a tendency not to look at management issues, which is the proper way to control the problem."

Harold Highland, founder and editor of *Computers & Security*, the professional journal of the International Federation for Information Processing, refers to the newest vaccines as "kindergarten variety." Highland recently commissioned a study of 20 commercially available antivirus products. The results, scheduled to be published early this year, make clear to Highland that the vaccine marketplace "has a very long way to go."

Temperamental vaccines

The study's investigators encountered temperamental products that crashed systems and inexplicably worked only with particular text editors. Highland says he has seen vaccines that "are effective against only one or two types of viruses — though they don't tell you that."

Highland says some products are apparently marketed without being tested on the viruses they claim to protect against, since captured viruses must be carefully controlled and are not readily distributed for commercial testing. Highland declined to provide more specific findings of the research.

Martin King, manager of audit services at Computer Associates International, Inc., agrees with the characterization of some vaccine vendors as carpetbaggers but contrasts their work with the development effort he says went into CA's CA-Examine.

Beginning in 1984, King, who has been lecturing on security issues for the past eight years, led a team that developed the antiviral package for IBM MVS systems, which is now in place at about 400 companies worldwide.

> "ONCE YOU throw in a vaccine, there's a tendency not to look at management issues, which is the proper way to control the problem."
>
> DEL JONES
> NATIONAL LAN LABORATORY

The software, developed in cooperation with U.S. government agencies and Big Eight accounting firms, took two years to gel, contains 150,000 lines of assembler code and wields more than 100 on-line analysis displays, King says. "It's serious software," he maintains.

One vendor that takes pains to acknowledge limitations of its vaccine is HJC Software, Inc., which makes a package called Virex for the Apple Computer, Inc. Macintosh environment.

"Right on the packaging, in the documentation and even when the program comes up, we say, 'Your computer is free of *known* viruses,'" says Robert Capon, president of the Durham, N.C.-based firm.

"We have a whole section in our documentation in which we emphasize that the use of products like Virex is not an alternative to adopting prudent computing practices, such as obtaining software from reliable sources and backing up," Capon adds.

He maintains that Virex was in development for nine months and that the firm had planned a Nov. 16 introduction six months prior.

"I was as surprised as everybody when the Arpanet virus hit. The timing was purely a coincidence," Capon says, admitting that the outbreak did give his marketing effort a significant boost.

Bard White, MIS director at Spaulding Sports Worldwide in Chicopee, Mass., chooses to rely on a vaccine as one segment of his antiviral armor. A year ago, he installed Systemate, Inc.'s Systemate vaccine on 150 IBM Personal Computers and compatibles as part of a security buildup. "It's like using a wood stove in the winter," White says of the vaccine. It provides partial protection and some psychological comfort, he says, "but at least you're trying to be proactive."

King echoes this attitude on the vaccine. "Though there's no perfect silver bullet," he says, "I'd rather have five or six lead ones and do the best I can rather than do nothing at all."

Pastore is a *Computerworld* copy editor.

Index

Marketplace 76
Used/Lease/Rent 76
Hardware 78
Software 78
Peripherals/Supplies 78
Graphics/Desk Top Pub 78
Time/Services 79
Bids/Proposals/Real Estate 79
Training 80

The BoCoEx index on used computers

Closing prices report for the week ending Dec. 29, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$725	$900	$400
XT Model 086	$1,150	$1,250	$900
XT Model 089	$1,225	$1,575	$1,050
AT Model 099	$1,675	$2,400	$1,525
AT Model 239	$1,925	$2,900	$1,800
AT Model 339	$2,200	$3,600	$1,800
PS/2 Model 30	$1,650	$1,700	$1,300
PS/2 Model 50	$2,350	$2,600	$1,900
Compaq Portable I	$600	$975	$600
Portable II	$1,700	$2,000	$1,650
Portable III	$2,800	$3,550	$2,500
Portable 286	$1,750	$2,400	$1,675
Plus	$1,100	$1,250	$800
Deskpro 286	$2,200	$3,150	$1,800
Deskpro 386	$3,600	$5,100	$3,800
Apple Macintosh 512	$600	$950	$550
512E	$850	$1,025	$600
Plus	$1,125	$1,325	$950
II	$4,200	$5,100	$3,800
NEC Multispeed	$775	$800	$725
Toshiba T3100	$2,500	$2,500	$2,000

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Used/Lease/Rent

• BUY NCR • SELL
• SYSTEMS
• COMPONENTS
"SINCE HARWOOD INTERNATIONAL CORPORATION 1976"
• PERIPHERALS
• NEW EQUIPMENT
HARWOOD INTERNATIONAL CORPORATION
100 Northshore Office Park
Chattanooga, TN 37343
615-870-5500
TELEX:3785891 FAX:615-875-5199

WANT TO BUY
3720'S • 3725'S
FOR SALE
3720's • 3725's • 3745's
DDC Communication Controller Specialists
Distinctive Dataprocessing Consultants, Inc.
Call us for a quote on your features, upgrades, and line sets!
(214) 869-2214
FAX 214-869-1589

DEC VAX & AT&T
BUY-SELL-NEW-USED
Systems, Peripherals, Options available for sale
Looking to purchase VAX and AT&T Systems, Hardware
LAKEWOOD COMPUTER CORP.
436 Link Lane
Ft. Collins, CO 80524
(303) 493-6406 FAX:(303) 493-6409
ddo

PROCESSOR POWER
Do You Need...
★ 42-74 Mips of IBM Compatible Power
★ 40% Less $ than IBM
★ 12-36 month financing
★ NOW
Call Major Computer Incorporated
(612) 933-6000

Used/Lease/Rent

IBM 4300 SERIES 1 SYSTEM 36/38 SYSTEM AS/400

MEMBER OF CDLA

*SPECIAL LEASE RATES ON NEW AS/400's

• Buy • Sell • Lease • Trade • New • Used
• IBM Warranty/IBM Maintenance Guaranteed
• Disk • Terminals
• Flexible Lease Options Tailored to Your Needs
• Printers • Tape

MEMBER OF WAEL

• Equipment Configured To Your Requirements
• All CPU Upgrades

NEWPORT LEASING, INC.
800-6789-IBM
2 Faraday, Irvine, CA 92718
714/770-2122
FAX: 714/770-5441

IF YOU'RE BUYING, WE'RE SELLING

36 38 4300

IF YOU'RE SELLING, WE'RE BUYING

IBM SYSTEMS
Buy • Sell • Lease PERIPHERALS

(800) 331-8283
TOLL FREE

(213) 394-1561
CALIFORNIA

Ocean Computers, Inc.
919 Santa Monica Blvd., Ste. 200
Santa Monica, CA 90401

CDLA

HP 3000

ATP's • S/70
7937H • 7933H

Available in Quantity

Processors • Peripherals
Systems

All In Stock - Immediate Delivery

All warranted to qualify for manufacturer's maintenance

BUY • SELL • TRADE
RENT • LEASE

ConAm Corporation
It's Performance That Counts!
800/643-4954 213/829-2277

BUY, SELL LEASE IBM CPU's

3081's, 3083's, 3084-QXX, 3090
PILLAR SILENT BLOCK, PARALLEL CABINET

GTEX Financial Group
(214) 783-1212

CDLA Est. 1978

RT
937X
Series/1
AS/400
System 36, 38
4300

Buy, Sell, Lease, Rent

612•942-9830

All IBM Machines and Parts

DATATREND Inc.
10250 Valley View Road
Suite 149
Eden Prairie, Minnesota 55344

BUY OR SELL
NEW OR USED

IBM PC * XT * AT * PS/2
COMPAQ * HP * AT&T * WANG
MACINTOSH * APPLE 2

1-800-262-6399

Boston Computer Exchange Corporation
MA 617-542-4414
FAX 617-542-8849

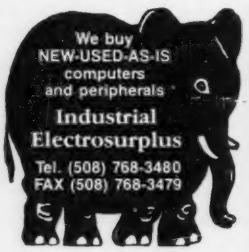
HONEYWELL

LEVEL 6 DPS 6 SERIES 16

• Complete Minicomputer Line New & Used
• All Peripherals and Terminals
• Upgrades and Features
• Depot Repair Capability
• Honeywell Maintenance Guaranteed
• Immediate Delivery Low Prices
• HDS 5 and HDS 7 Compatible Terminals

The Recognized Leader in Honeywell Minicomputer Sales and Support

BCS
BOUDREAU COMPUTER SERVICES
100 Beartoot Road.
Northboro, MA 01532
(508) 393-6839
FAX 508-393-3781



$ SAVE $
IBM DISPLAYWRITERS
AS/400
36's, 38's, 4300's

IBM compatible printers
* IBM * DEC * WANG * XEROX
Printers, Terminals, CPU's & DISKS

LRK RESOURCES UNLTD INC.
FAX 713 437-4945
713-437-7379
800-523-8903

---

minicomputer exchange
since 1973

BUY • SELL
BROKER • SERVICE

sun microsystems

DEC

DG

Computers • Systems
Peripherals

CAD/CAE Equipment

Call 408-733-4400
FAX: 408-733-8009

IBM
BUY • SELL • LEASE
CDLA

AS/400
S/3X
S/1 POS
PARTS

AMCOM CORPORATION

800-328-7723
612-829-7445
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435

NORTHEAST MINICOMPUTER, INC.
55 High Street, Unit 6
Billerica, MA 01862

Wants to Buy Your Surplus DEC Computer Equipment

We Pay Cash for Your Unwanted Computer, Peripherals, Options, Memory, and Terminals.

Call 1-800-343-8302 or in Mass. 1-508-663-2550. Or Fax Your List 1-508-667-0718

Turn Your excess inventory into Cash $$$$

dda

WANT TO SELL

IBM 3081 Model K32
IBM 3082 Model 24
IBM 3087 Coolant Distrib. Unit
IBM 3278 Display Console

Available Jan 31, 1989
Price Negotiable
Call NOW

Jim Shaffer
405-943-8002

COMPUTERWORLD's Product Classified
MARKETPLACE

Examines the issues while Computer Professionals examine your message. Call for all the details.

(508) 620-7784 (508) 620-7758 (508) 620-7758

Reach over 612,000 more customers every week in Computerworld's
Marketplace

Computerworld's product classified Marketplace lets you market your products and services to *Computerworld's* total (ABC-audited) audience of over 612,000 computer professionals every week.

Related editorial for drawing readers
Customers are also attracted to Marketplace by articles on computer training and market trends. Plus there's a Closing Prices Report on new and used equipment and Fair Market Value, a statistical summary from International Data Corporation.

Free typesetting and ad creation
Choose "display" or "set-solid" formats for your Marketplace ad - then let *Computerworld* create and typeset it for you free of charge.

Telecopier service
Send your ad materials to *Computerworld* in seconds with our telecopier service. The toll-free number is (800) 343-6474 ext. 739/740. In Mass., (508) 620-7739/7740.

Call your Marketplace sales representative today to reserve your space.

East: Paul Bonarrigo, Account Manager
(508) 620-7784

Midwest: Marie Keyes, Account Manager
(508) 620-7758

West: Karen Massimino, Account Manager
(508) 620-7759

COMPUTERWORLD
MARKETPLACE PAGES
Where all computer buyers and sellers can go to market.

Used/Lease/Rent

CAD STATION $9,995

The Tektronix 4125 Color Graphics Terminal

Reconditioned Products: Our demo and lease returns are restored to latest specifications and are available with a variety of options.

These products carry Tek's full warranty.

For purchasing or leasing information, call

1-800-TEK-6100

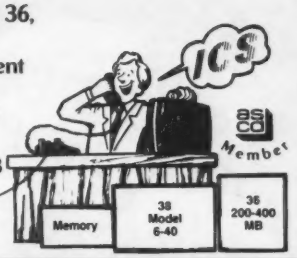
Tektronix
COMMITTED TO EXCELLENCE

GWD-117

Before You Reach the End of Your Line . . . Call ICS

- Upgrades
- Processors AS400, 36, 38, 43XX
- Peripheral Equipment

in California
(714) 838-3717
Call:
(800) 258-2233



DEC - IBM

BUY / SELL

VAXs
MICROVAX II, III SYSTEMS
PERIPHERALS
IBM XT, AT
ALL MICROS
IN STOCK
IBM AT 339s (New & Refurb)
IBM 3174 51Rs (New & Refurb)
IBM 3179-100

LINK PROCESSOR

603 E. Town St.
Columbus, OH 43215
Phone: 614-464-1638
FAX: 614-239-8386

CALL US LAST

GET YOUR BEST PRICE
Then Call
SPECTRA PRODUCTS, INC.
For The Best DEAL
WE
Buy - Sell - Lease - Rent
IBM and DEC™SYSTEMS
NEW and USED
Other Services Available
Installation and Maintenance
Contract Programming

Call 800-238-6405
IN TN 901-754-8500

SPECTRA PRODUCTS, INC.
1869 KIRBY PKWY. MEMPHIS, TN 38119

"SINCE 1974"
Formerly Computer Brokers, Inc.

We buy, sell, lease & rent quality new and used equipment. And we stand behind it for a year.

digital™

SA482-AA (New) 2.488GB Storage Array $52,000.00	**Printronix** P600 (600LPM) $1,995.00 **LQP03** w/sheet feeder $395.00 **LA100-PC** $500.00	**RA81-AA** 456 Winchester Disk Drive $6,500.00
MS650-CA 8MB Memory For MVII $2,995.00	**MICROVAX II** Configured to your needs CALL...	Long and Short Term Leases and Rentals Available CALL...
RA82-AA 622MB Winchester Disk Drive $13,500.00	Wanted Sun Microsystem Computer equipment, any system, any configuration	We pay Cash for New, Used and Obsolete Surplus DEC Equipment

TRIDEX CORPORATION

Phone: 603-886-0383
Fax: 603-886-0914

375A WEST HOLLIS ST. NASHUA, NH 03061

DEC PDP-11

SYSTEMS & PERIPHERALS

BUY & SELL

THE One-Stop EXCHANGE!
- CPUS • TERMINALS
- DISC DRIVES • PRINTERS
- INTERFACES, ETC.

dce DIGITAL COMPUTER EXCHANGE INC
27773 Industrial Blvd., Hayward, CA 94545
FAX (415) 887-5580 TLX 709536

Call (415) 887-3100

Partial Listing	DATA GENERAL	Call for Prices
Systems	**Memories/Options**	**Peripherals**
MV 20000 MOD1	MV20000 4,8,16,32 MB	6161 S/S 147MB
MV 20000 MOD2	MV15000 4,8,16,32 MB	6160 S/S 73MB
MV 15000 MOD20	MV10000 2,4,8 MB	6214 S/S 602MB
MV 10000 8MB	MV8000 2MB	6061 S/S 192MB
MV 8000-II 8MB	S-140 250KB	6122 S/S 277MB
MV 8000 9300 Series	DESKTOP (All Sizes)	6329 120MB
MV 7800 4MB	ISC - 2	6236 S/S 354MB
MV 4000 DC Loaded	IAC - 16	6237 S/S 1.06GB
MV 4000 2MB	IAC - 8	6239 S/S 592MB
S-140 HFP, BMC	**Terminals**	6125 Streamer
Desktop All Mods	D200	6026 S/S 800/1600 BPI
System Upgrades	D211	6300 1600/6250 BPI
MV20000 Mod 1 to Mod 2	D215	4374 1200 LPM
MV15000 Mod 8 to Mod 20	D410	4373 890 LPM
MV15000 Mod 10 to Mod 20	D460	4327 300 LPM

International Computing Systems
Box 343 Hopkins, MN 55343
(612) 935-8112 FAX (612) 933-9664

WANTED: DEAD OR ALIVE - All DG Systems

We Buy & Sell DEC

Systems Components

Digital Computer Resale

call:713 445-0082

600 Kennick Ste C22
Houston, Tx 77060

IBM SPECIALISTS

SELL • LEASE • BUY
S/34 S/36 S/38 AS/400
3741 3742

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

800-251-2670
IN TENNESSEE (615) 847-4031

WANTED

OBSOLETE AND EXCESS COMPUTER EQUIPMENT

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system.

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

BURROUGHS

UNISYS
B20 - B7000
A Series - V Series
All Peripherals

Low Lease Rates

Depot Maintenance

LDI/
COMPUTER PROVISIONS CORPORATION

(216) 687-0307

BE Associates inc.

- Data General
- Fujitsu
- Data Products
- CDC
- Printronix
- Zetaco

BUY SELL TRADE

(617) 982-9664
FAX: (617) 871-4456

CMA COMPUTER MARKETING of America, Inc.

PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

FREE ad creation and typesetting for your Computerworld Marketplace ad.

For complete details.
Call Cindy Delany, Operations Manager,
at 800-343-6474, ext. 719
(in Massachusetts), 508-879-0700, ext. 719)

Used/Lease/Rent Hardware

IBM BUY · SELL · LEASE

Member Computer Dealers & Lessors Association CDLA

SYSTEM 36/38 · AS/400 · 43XX 30XX · AT&T VOICE SYSTEMS · SERIES 1

- Processors
- Peripherals
- Upgrades

DEMPSEY & ASSOCIATES Inc.

18377 Beach Blvd., Suite 323
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

FOR SALE!

12MHz AT Systems
(starting at $1295.00)

20MHz 386 Systems
(starting at $2495.00)

Call
NCC
(508) 820-0335

BUY SELL LEASE
DEC/VAX

CALL
LDI/
COMPUTER
PROVISIONS
Lou Vascek
(216) 687-0307

We Buy, Sell & Lease IBM Processors and Peripheral Equipment

DASD	CPU's	Tape Drives
3380 3375 3370 9335 Immediate Delivery	9370 4381 4341 4361 Sale/Lease	3480 3430 3420 3422 Immediate Delivery

Display Stations	Controllers	Printers
3178 3278 3179 3279 3180 3191 Immediate Delivery	3880 3803 3725 3274 3174 3705 Immediate Delivery	4245 4248 3800 3203 3262 4214 Immediate Delivery

Computer Marketing Inc.
PO BOX 0, MARGATE, NJ 08402-0430
609/823-6000
Contact/Bernie Gest
Telex: 5106012293
Established 1969 CDLA

IBM Unit Record Equipment
Data Modules/Disk Packs
Magnetic Tape/Diskettes

029-082-083-084-085-088
129-514-519-548-557-188

2316-3336(1)&(11)-3348(70)
80-200-300 MB
Disk Packs

Thomas Computer Corp.
6636 W. Howard Chicago IL 60648
800-621-3906 312-647-0880

SAVE SAVE SAVE SAVE SAVE
DESKTOP PUBLISHERS & LASER PRINTERS
- REDUCE MAINTENANCE COSTS!
- ELIMINATE PAPER JAMS!
- KEEP YOUR PRINTER/COPIER FREE OF TONER AND PAPER DUST!

INTRODUCING
LASERLUBE & CLEAN
Pkg. of 12 LASERLUBE & CLEAN Disks ..... only $19.95
•extends your printer at peak performance for at least one year as monthly cleaning is the recommended minimum service!

TO ORDER CALL OR WRITE
LASER PRINTER PRODUCTS
27 Glen St., Stoughton, MA 02072
1-800-521-7968 (24HRS.)
(617) 341-3005 (9-5 PM EASTERN)
Mastercard - Visa - COD
Dealer Inquiries Welcome
SAVE SAVE SAVE SAVE SAVE

GENUINE hp **HEWLETT PACKARD TONERS**
$79.50 Series II (92295A) Or Original (92295A)
Huge Inventory In Stock
For Same Day Shipment Call
•1-800-22-TONER
•1-800-228-6637
Plotter Supplies At Similar Savings
TONERS PLUS...

Peripherals/Supplies

HEWLETT · PACKARD
1000 ● 3000 ● 9000
Computers ● Peripherals
Terminals
Buy ● Sell ● Rent ● Lease

EURODATA INC.
2574 Sheffield Road
Ottawa, Canada K1B 3V7
613-745-0921
FAX: 613-745-1172

PRIME
Surplus Sale
9955 CPU $40,000 or offer
CDC 9775 675mb $1,500.
Telex GCR tri-density $10,000.
1,000 LPM data printer $2,000.
600 LPM data products $2,500.
Terminals - PT200, PST100, Wise 50, 60 Call
Special Tab ASCII terminals $75. each
ICS 32 ports $6,000.
(409) 842-9355

VAX RENTALS
MV 3500/3600
MICROVAX II
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals
- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility

6 Months ● 12 Months ● 36 Months

BROOKVALE ASSOCIATES
ddb Digital Dealers Association
(516) 273-7777 (206) 392-9878

PRIME
EXPERIENCED SYSTEMS AND PERIPHERALS
BUY-SELL-LEASE-BROKERAGE
NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY
PLUS
THE FASTEST I/O AVAILABLE ANYWHERE
1ST SOLUTIONS, INC
11460 N CAVE CREEK ROAD
PHOENIX, AZ 85020
602-997-0997
ASK FOR DON SHIFRIS

AS/400
S/38 S/36
Upgrades - Features
Displays - Printers

GENICOM PRINTERS
Twinax - Coax
Faster than IBM -
- 40% Less Cost

QUICK DELIVERY
BEST PRICE
TOLL-FREE HOTLINE
LeasPak International
1-800-532-7725

Reconditioned digital™ **Equipment**

Whatever your requirements are for Digital Equipment, call CSI *first!* Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is ***eligible for DEC maintenance.***

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.

CSI Compurex Systems, Inc.
75 Toeca Dr. Stoughton, MA 02072
CALL TOLL-FREE 1-800-426-5499
In Mass. (617) 344-8600
FAX (617) 344-4199

FREE BUYER'S GUIDE

When you need programmer's development tools, Programmer's Connection is your best one-stop source. We are an independent dealer representing more than 300 manufacturers with over 800 software products for IBM personal computers and compatibles including: COBOL compilers and utilities, relational databases, and much more. Call today to receive a **FREE** comprehensive Buyer's Guide, and find out why Programmer's Connection is your best connection for software tools.

Programmer's Connection
7249 Whipple Ave NW
North Canton, Ohio 44720
US 800-336-1166

Canada	800-225-1166
OH & AK (Collect)	216-494-3781
FAX	216-494-5260
Telex	9102406879
International	216-494-3781

Software

It's the Computerworld MARKETPLACE

- ☐ *Used/Lease/Rent*
- ☐ *Hardware*
- ☐ *Software*
- ☐ *Peripherals/Supplies*
- ☐ *Communications*
- ☐ *Graphics/Desktop Publishing*
- ☐ *Time/Services*
- ☐ *Bids/Proposals/Real Estate*
- ☐ *Business Opportunities*
- ☐ *Training*

CALL NOW
(508) 879-0700

PC MONITOR TO BIG SCREEN from $787

LCD Projection Pads available for ALL IBM PCs & Compatibles and ALL Macintosh models.

BOXLIGHT offers the broadest selection and most competitive pricing with products by KODAK, APOLLO and other leading manufacturers.

- 1 year parts & labor warranty
- 30 day money-back guarantee
- Factory service

To Order Call:
1-800-762-5757
in CA 415-892-4744

BOXLIGHT CORPORATION

MC Visa American Express COD

READ ALL ABOUT IT!

- Closing Prices on New & Used Equipment
- Fair Market Value Data
- Computer and Software Training
- Computerworld MARKETPLACE

(508)620-7758
(508)620-7759
(508)-620-7784

COMPUTERWORLD MARKETPLACE PAGES
Where all computer buyers and sellers can go to market

Graphics/Desktop Publishing

Time/Services

NOTECH

Innovative Computer Techniques

COMPUTER SERVICES

IBM 3084

• Batch Processing • Public Network Access
• Timesharing • Laser Printing

Route 202, Raritan, N.J. 08869
201-685-3400
Contact: Joyce Bogasenko

---

dtl INDUSTRIES
TELECOMMUNICATION CONSULTING
Computers, Networks, & Phone Systems
619-276-1050
Call for FREE evaluation or additional information

In Celebration of the New Year
30% off NORMAL SERVICES*
* Upon acceptance of contract by 2-1-89

2311 Cecelia Terrace
San Diego, CA 92110

Computerworld's MARKETPLACE section

Looking for a way to reach information systems professionals with your advertising message? Call a Computerworld product classified sales representative for all the details on the Marketplace sections.

East
(508) 620-7784
Midwest
(508) 620-7758
West
(508) 620-7759

COMPUTER SERVICES

MVS/XA	VM/SP
ISPF/PDF	CMS
IMS	SAS
CICS	FOCUS
DB2/QMF	INQUIRE

TYMNET
LASER PRINTING
(415) 768-1390
Unisys 1100/92 Services Also Available

B E C H T E L
INFORMATION SERVICES

COMPUTING SERVICES

MVS/XA	VM/370
DOS/VSE	CICS
TSO	CMS
DB2	IMS/DBDC
4GL	SAS

MULTIPLE CPUs - 50+ MIPS

TELENET, TYMNET

IBM INFORMATION NETWORK

DEDICATED SYSTEMS AVAILABLE

GIS
INFORMATION SYSTEMS, INC.
815 COMMERCE DRIVE
OAK BROOK, IL 60521
312-574-3636

MIS
SUCCESS WITHOUT STRESS

NATIONWIDE REMOTE COMPUTING SERVICES

- Fixed Price Computing
- Remote Facilities Management
- General Time-sharing Services
- Image/Forms Design and Laser Printing
- Integrated Financial Applications
- Major Third Party Software Packages
- Micro/Mainframe Applications
- Nationwide Network
- Operating System Conversions
- Overflow Processing

DATA CENTERS:
Boston, MA
Los Angeles, CA
Washington, DC

CALL 1 800 PLAN LCS
1 800 752-6527

Litton
Computer Services

COST-EFFECTIVE COMPUTING SERVICES for TODAY and ... TOMORROW

OUR MODERN DATA CENTER provides you with low-cost, state-of-the-art computing services.

- IBM® CPUs and Peripherals
- Systems Software: MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS
- Application Software: Database Management, Application Development, 4/GLs, Statistical Analysis, Graphics
- Multiple Communications Methods
- Technical Support
- Pricing to fit your needs

IBM is a registered trademark of International Business Machines Corporation

For more information Call Jeff Daum
201-896-2030

Or Write
Jeff Daum,
Vice-President
P.O. Box 26
Carlstadt, NJ 07072

Bids/Proposals/Real Estate

City of Northampton
Data Processing Department

The City of Northampton, MA is seeking qualified computer consultants experienced in preparing "Request for Proposals" for the purchase of computer hardware and Municipal Applications Software. The City currently has a Burroughs B1965 computer with 2MB of main memory, 2 printers and 20 assorted remote terminals and printers. All interested applicants must have prior municipal and school administration experience. For detailed specifications please contact:

Lorna Cournoyer
Director of Data Processing
(413) 586-4950 x235

Deadline for submitting proposals is 2/3/89. Funding for this project is approx. $22,000.

VIDEO-BASED INFORMATION SYSTEMS TRAINING
REQUESTED FOR THE CITY OF NEW YORK

The Department of Personnel of the City of New York has issued a Request for Qualified Consultants to provide a wide variety of state-of-the-art video-based information systems training courses. Copies of the Request may be obtained from: Irwin B. Kroot, Computer Training Administrator, NYC Department of Personnel, 220 Church Street, New York, NY 10013, 212-566-5980.

A pre-proposers' conference to answer questions or clarify issues for potential proposers will be held on January 17, 1989 at 2 PM, at the above address. All potential proposers are invited to attend this conference.

The deadline for receipt of proposals is 5:00 PM on January 27, 1989. Further details concerning specifications, the conference, and proposal submission may be found within the Request.

Your used computer equipment deserves a second chance

If you have used computer equipment to sell, *Computerworld's* product classified Marketplace is the best place to do your selling. That's because Marketplace features a Used Equipment section to help you market your equipment to the very people who are looking to buy.

And when you advertise in *Computerworld* Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to *Computerworld* for news, information, features - and Marketplace - every week.

So give your used computer equipment a second chance today. Call 800/343-6474 (in MA, 508/879-0700) to reserve your space.

COMPUTERWORLD MARKETPLACE PAGES
Where all computer buyers and sellers can go to market.

Yes, there still is

DEC-20 TIMESHARING

LANDART SYSTEMS INC
65 Broadway
New York, NY 10006
(212) 363-3170

It's the Computerworld *MARKETPLACE*

Reach Information Systems Professionals Where They Shop

- ☐ Used/Lease/Rent
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity
- ☐ Training

CALL NOW
800-343-7464

COMPUTERWORLD MARKETPLACE PAGES
Where all computer buyers and sellers can go to market.

Data Cartridge
Data Cartridge

- **Data Cartridge Duplication**
  Most Formats
  100% Verified
  Quick Turnaround
- **Disk Duplication**
  3½", 5¼" or 8"
  Any Format
- Custom labeling, packaging, and fulfillment are also available.

Dunhill

Dunhill Software Services, Inc.
7275 Bush Lake Road
Minneapolis, MN 55435
(612) 897-3640
1-800-356-7911

370/BAL→C
APPRENTICE

Convert your 360-370 Assembler source code to C or Pascal with our BAL/C Apprentice

SymbTech
(508) 460-0335

NEW!
IBM MVS-ESA Test and Development Center

- IBM 3090/300E - PR/SM
- IBM 3090/120E - Standalone
- Destructive Testing
- Major Databases - DB2, IMS
- Worldwide Network
- Early Release Site

Remote Computing Services
24 Hours/
7 days a Week

- Dual 3090s - MVS/XA, VM
- DEC-VAX, Wang/VS, HP3000
- Extensive Software Available
- Application Proc'ing
- Cost Effective

INET
INFORMATION NETWORK CORPORATION

For More Information And Pricing Call
1-800-222-1590, Ext 372

A manager's obligation to self

Training directors owe it to their firms to stay abreast of what's new

BY EDMOND DROUIN
SPECIAL TO CW

How is your training mission statement coming? Do you have a clear description of roles and responsibilities for each member of your data processing training staff?

These statements, describing the training organization's mission and its relationships with clients, have become a prominent issue among managers in the years since Tom Peters and Robert Waterman wrote *In Search of Excellence.*

But another type of mission statement is equally important — one about the training manager's obligation to care for his own job and career. Unless he tends to his own growth and development, he will not be able to do so for others. If the training manager does not stay current with emerging technologies, management techniques, training methods and business developments, how can he deliver effective training for others?

This sense of taking care of oneself is much broader than the discredited values which arose from the "me generation." I view my obligation to myself as the responsibility for improving my knowledge and skills so that I can be a more effective manager tomorrow. I also need to allot time and energy to learn the coming technologies if I am going to lead the introduction of them into the organization.

Need to know

I believe that managers who ignore their responsibilities for self-development are cheating their employers. Training managers are paid to know how to use the most effective technologies for their organization and to prepare others to do so. They cannot do that if they do not know what is going on.

Colleagues may accuse you of taking jaunts to sunny climes when you attend a seminar on IBM-Digital Equipment Corp. integration. But the obligation of a manager is to lead the way to tomorrow, not to maintain training in yesterday's tools.

Let's look at tomorrow's tools. They are likely to include Unix, artificial intelligence, fourth-generation languages (4GLs), IBM's DB2, computer-aided software engineering, open operating systems and network platforms. Some other candidates are static analyzers, code generators, restructuring tools, testing products, image processing and voice input.

Some of you will say that you have a few of these tools today, so how can they be tomorrow's products? But tomorrow's tools are those beyond where you are today. Unix is more than a decade old, but if you do not have it, it is tomorrow's tool for you.

IF THE TRAINING manager does not stay current with emerging technologies, management techniques, training methods and business developments, how can he deliver effective training for others?

When I suggest that managers need to be aware of new technologies, I don't mean the front edge of 5GLs; I mean they must evaluate where their organization is today and its probable migration path to the future.

How does one plan for the introduction of new tools? Other companies probably have preceded you in using them, and their training managers can be a great source of information. Also, there are regional training groups in most areas; their value cannot be overstated, as managers consider the issues involved in migrating to new tools.

There are three other areas of personal development to which managers should feel an obligation. Just as they need to stay current with technology, they must do the following:

- Stay current with the latest in managerial skills.
- Understand new training design techniques.
- Keep in close touch with the organization's changing business; MIS and MIS training are service units for that business.

I can hear the sighs and the complaints that there is really nothing new in management, only new buzzwords. But as with technology, new is only the step beyond where you are standing today. If you manage with tight controls and high structure, participative techniques may be your new managerial technology.

Perhaps you like having structure and control — that is your style, and you are comfortable with it. That rationale for resisting change is no more valid than the reasoning of a manager who wants to have all systems written with Cobol and IMS because he likes them and they are his style.

As for training design, what of techniques beyond pedagogy? What of synergogic methods, which emphasize students training one another? How about experiential learning designs, in which a seemingly farfetched experience can help students master specific management principles or other concepts. How much has your organization done to follow and evaluate such design trends?

Finally, how well do you stay current with changes in your firm's business? Does your firm have a new strategy? Do you know it? Does your firm have new subsidiaries? If so, do you know their functions?

Now ask yourself whether your training manager's level of activity in such pursuits is enough to maintain the status of a leading change agent in the firm.

That job is the training manager's role: leading people to change their knowledge, skills, attitudes and abilities. A training manager who does not see that role for himself should find a career that better suits his vision. Training managers who do see this role as the one for them should not cheat their firm or themselves by failing to meet their obligation of self-improvement.

Drouin is director of DP Education & Training at Liberty Mutual Insurance Co. in Portsmouth, N.H.

The best workbooks are also the most cost-effective:

FastDoc™
for PCs and MACs

- ▲ Customize workbooks for Lotus 1-2-3, Excel, WordPerfect & 16 other leading programs
- ▲ Produce as many workbooks as you need at no extra cost
- ▲ Stored as Pagemaker templates—easy to use
- ▲ Favorably reviewed as "simple but shrewd" and "most promising"

Phone today for your free DemoDoc
1-800-441-5441

KDA Software, Inc.
315 E. Third Street, P.O. Box 1163, Centralia, IL 62801

Educate your customers through Computerworld Marketplace's *Training Section.*

For More Information Call (508) 879-0700

COMPUTERWORLD CLASSIFIED MARKETPLACE

1989 Computerworld Editorial Contents

1/16	- Product Spotlight: Corporate Electronic Publishing
1/23	- Executive Report: Restructuring MIS - The Data Center
1/30	- Product Spotlight: Micro-to-Host Links
*2/6	- Special Report: Communications Innovations
2/13	- Special Report: Recruitment Product Spotlight: Performance Management Tools
2/20	- Executive Report: Strategic Planning
*2/27	- Product Spotlight: Relational DBMS
*3/6	- Special Report: Systems Integration Executive Report: MIS in the Federal Government
3/13	- Product Spotlight: Disaster Prevention & Recovery
3/20	- Executive Report: Human Resource Development
3/27	- Product Spotlight: CASE Products
*4/3	- Executive Report: Cost Control & Justification
4/10	- Product Spotlight: PC's & Comptibles
4/17	- Executive Report: Restructuring MIS - Distributing Resources
4/24	- Executive Report: Managing after a Merger
5/1	- Product Spotlight: Network Management Tools
5/8	- Executive Report: Automating the Data Center
5/15	- Product Spotlight: Manufacturing Technology
5/22	- Executive Report: Business Executive Assess MIS
5/29	- Product Spotlight: Printers & Plotters

* Indicates Show Distribution

COMPUTERWORLD MARKETPLACE PAGES
Where all computer buyers and sellers can go to market.

"Welcome to Biddle Barter and Troll, where we all share success and one copy of Computerworld."

While sharing success is admirable, sharing COMPUTERWORLD is not.

Because when a magazine is meant to be pored over and referred to, it's meant to be kept close at hand.

The solution?
Your own subscription.

You can have a personal subscription to COMPUTERWORLD. All yours. Every week.

It will give you a complete rundown of everything that's happening in the computing arena — a macro package at a micro price. You'll stay on top of the news and nuances of the industry. And the praises and problems of its products.

In fact, with COMPUTERWORLD in your hand, you'll have the best possible grip on your field.

Bonus issues of COMPUTERWORLD FOCUS free.

Order your own subscription to COMPUTERWORLD today. You'll get 51 information-packed issues. Plus bonus issues of COMPUTERWORLD FOCUS — absolutely FREE. So in addition to getting the weekly news of the computer community, you'll get an in-depth exploration of its most timely topics. Topics that include communications, data security, networking, PC's, and more.

Plus you'll get our special Spotlight section . . . featuring detailed head-to-head comparisons of the industry's latest products.

So order now. Use the postage paid subscription card bound into this issue and get your own subscription. Because the people who share success aren't the ones sharing COMPUTERWORLD.

COMPUTERWORLD

375 Cochituate Road, Framingham, MA 01701

Which publication should you read for the most complete coverage of the news you need?

When the virus hit, only Computerworld gave you the whole story. When you needed it.

In the days that followed the attack of a computer virus that brought thousands of systems to their knees, *Computerworld* delivered the most immediate news coverage and in-depth follow up — others didn't even come close.

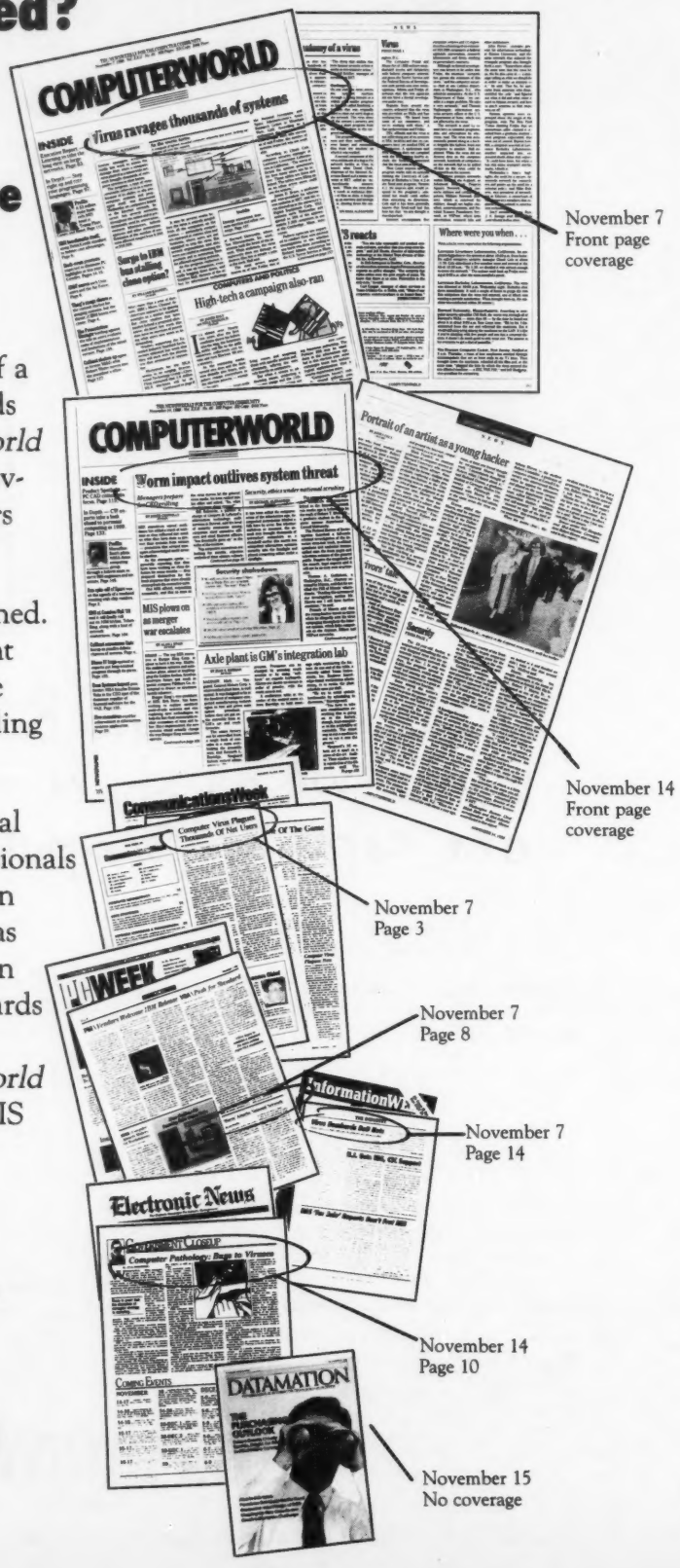
Computerworld told you what happened. How it happened. And how to prevent it from happening to you. You got the whole story. But only if you were reading *Computerworld.*

When it comes to delivering the critical news that information systems professionals demand, *Computerworld* is the proven leader. That's why *Computerworld* was named "Best Computer Newspaper" in the third annual Computer Press Awards Competition. And why independent studies consistently show *Computerworld* to be the publication most read by MIS decision makers.

You decide. Every week.

COMPUTERWORLD

An IDG Communications Publication



COMPUTERWORLD

SALES OFFICES

Publisher/Fritz Landmann

Vice President/Associate Publisher/Val Landi, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700

BOSTON: Northern Regional Director/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Paula Wright, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

CHICAGO: Eastern Regional Director/Bernie Hockswender, Midwest Regional Manager/Kevin McPherson, District Manager/Larry Craven, Sales Assistants/Kathy Sullivant, Karol Langa, COMPUTERWORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Eastern Regional Director/Bernie Hockswender, District Managers/Fred Lo Sapio, Frank Genovese, Sales Assistant/Linda Pipines, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES: Western U.S Director/Jan Harper, Southwestern Regional Manager/Carolyn Knox, District Manager/Darren K. Ford, Sales Assistant/Bev Raus, COMPUTERWORLD, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Western U.S Director/Jan Harper, Senior District Manager/Ernie Chamberlain, District Managers/ Michela O'Connor, Alicia Sarbalis, **Sales Assistants/**Chris Kobayashi, Nurit Zekman, **COMPUTERWORLD,** 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Eastern Regional Director/Bernie Hockswender, **Southeastern Regional Manager/**Kevin C. Herold, **Account Manager/**Melissa Christie Neighbors, **Sales Assistant/**Debra Brown, **COMPUTERWORLD,** 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Eastern Regional Director/Bernie Hockswender, **Southeastern Regional Manager/**Kevin C. Herold, **Sales Assistant/**Brenda Shipman, **COMPUTERWORLD,** 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: Eastern Regional Director/Bernie Hockswender, **District Manager/**Paula Smith, **COMPUTERWORLD,** Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Classified Advertising Director/John Corrigan, 375 Cochituate Rd., Framingham, MA (508) 879-0700

Midwest Account Manager/Marie Keyes, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171, (508) 879-0700

New England Account Manager/Paul Bonarrigo, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

Western Account Manager/Karen Massimino, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England/375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

Mid-Atlantic Recruitment Manager/Warren Kolber, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest Recruitment Manager/Patricia Powers, O'Hare Corporate Tower One, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy, 18004 Skypark Circle, Suite 100, Irvine, CA 92714 (714) 250-0164

South-Atlantic Recruitment Manager/Kathryn Kness, 8304 Professional Hill Dr., Fairfax, VA 22031 (703) 573-4115

Recruitment Account Executives: New England/Nancy Percival, **Mid-Atlantic/**Jay Novack, **South-Atlantic/**Pauline Smith, **Midwest/**Ellen Casey, **Western/**Chris Glenn, 1-800-343-6474 or (508) 879-0700

IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, **COMPUTERWORLD,** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/**President**

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, Telex: 95-1153, FAX: 508-872-8564

Vice President/Associate Publisher, Val Landi

OPERATIONS **Vice President/Operations,** Matthew Smith. **Business Manager,** Mark Sullivan.
SALES **Advertising Director,** Carolyn Novack. **National Recruitment Sales Director,** John Corrigan.
Display Advertising Production Manager, Maureen Carter. **Classified Operations Manager,** Cynthia Delany.
MARKETING **Vice President Marketing & Circulation,** Jack Edmonston. **Marketing Communications Director,** Jan Bell.
Marketing Services Director, Audrey Shohan. **Manager/Marketing Communications,** Mary Doyle.
CIRCULATION **Vice President Marketing & Circulation,** Jack Edmonston.
Director of Circulation Management, Maureen Burke. **Director of Circulation Promotion,** Carol Spach.
PRODUCTION **Production Director,** Leigh Horneth. **Assistant Production Director,** Carol Polack.
Production Manager, Beverly Wolff. **Art Director,** Tom Monahan.

FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

Asia: S.W. Chan, Asian Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX). FAX: (011) 852 5 86 10953.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR). FAX: (011) 61 2 439 5512.

Austria: Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Ziegergasse 6, A-1070 Wien, Austria. Phone: (011) 43-93-16-31-0 or (011) 43-93-05-08-0. Telex: 115542 SCH/A. FAX: (011) 43-93-05-08-33.

Brazil: Hey Knust, Computerworld do Brazil Ltda, Praca Floriano, 19/26 Andar, CEP.20031 Rio de Janiero. Phone: (011) 55 21 240 8225. Telex: (391) 21 30830 BR.

Denmark: Preben Engell, Computerworld Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695. Telex: (855) 31566. FAX: (011) 45 154 56 14.

France: Francois Chaussonniere, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F. FAX: (011) 33 14 241552.

Hungary: Dezso Futasz, Computerworld Informatika Co., Kft. Pf. 380, 1536 Budapest, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 22 6307 (KSH H).

Italy: Umberto Costamagna, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39-2-2613432. Telex: (843) 335318. FAX: (011) 39 2 282 0886.

Japan: Dick Yamashita, Computerworld Japan, Akasaka Omotemachi Bldg., Minato-Ku, Tokyo 107. Phone: (011) 81 3 551 3882. Telex: (781) 252-4217. FAX: (011) 81 3 582 7239.

M. Nakamura, IDG Communications, Japan, c/o Marcom International, Inc., Akasaka Center Building, 1-3-12 Motoakasaka, Minato-ku, Tokyo 107, Japan. Phone: (011) 81 3 403-8515. Telex: (781) J27941 (reps for all CW Publishing publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma. 06700 Mexico. Phone: (905) 514 4218 or 6309. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam. The Netherlands. Phone: (011) 31 20 646426. Telex: (844) 18242 (CWCOM NL).

New Zealand: Martin Taylor, Computerworld Communications Ltd., 2nd Floor, 15 Augustus Terrace, Parnell, Auckland, New Zealand. Phone: (011) 64-9-779-902. Fax: (011) 64 9 774 604.

Norway: Morten Hansen, CW Norge A/S, Hovinveien 43, 0576, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N). FAX: (011) 47 268 0152.

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 814 0044. Telex: (716) 222214 (CCW CN).

Spain: Paco Zabala, CW Communications, S.A., Rafael Calvo, 18, 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 45522 (CW E). FAX: (011) 341 419 61 04.

Sweden: Bengt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 67 91 80. Telex: (854) 14904 9 (NOVACW). FAX: (011) 46 8 65 3132.

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Wittikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH). FAX: (011) 41 1 55 1135.

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578, Room 503# 1, Fu Hsin, S. Road Sec 1, Taipei, Taiwan, R.O.C. Phone: (011) 886 2 721 4302. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications). FAX: (011) 886 2 731 0420.

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346 (THEPUB G). FAX: (011) 44 1 405 2347.

United Kingdom: Euan Rose, Beere Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 44 926 512424. Telex: (851) 311951 (BEEHOB). (Representative for all CWCI publications). FAX: (011) 44 926 512948.

Venezuela: Kalman von Vejna Nagy, CW Comunicaciones, C.R.L. Tore Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30. FAX: (011) 58 2 724970.

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0429, 8000 Munich 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D). FAX: (011) 49 89 3 60 86109.

IDG COMMUNICATIONS/INC.

Patrick J. McGovern	Axel Leblois	William P. Murphy
Board Chairman	**Chief Executive Officer**	**Vice President/Finance**

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG CommunicaCions publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S *Computerworld Argentina;* ASIA'S *Communicaciones World, Computerworld Hong Kong, Computerworld Southeast Asia, PC Review;* AUSTRALIA'S *Computerworld Australia, Communicaciones World, Australian PC World, Australian Macworld;* AUSTRIA'S *Computerwelt Oesterreich;* BRAZIL'S *DataNews, PC Mundo, Micro Mundo;* CANADA'S *Computer Data;* CHILE'S *Informatica, Computacion Personal;* DENMARK'S *Computerworld Danmark, PC World Danmark, CAD/CAM World;* FINLAND'S *Mikro, Tietoviikko;* FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Telecoms International;* GREECE'S *Computer Age;* HUNGARY'S *Computerworld SZT, PC Mikrovilag;* INDIA'S *Dataquest, PC World India;* ISRAEL'S *People & Computers Monthly, People & Computers Weekly, SBM Monthly;* ITALY'S *Computerworld Italia;* JAPAN'S *Computerworld Japan, Semicon News;* MEXICO'S *Computerworld Mexico, PC Journal;* THE NETHERLANDS' *Computerworld Netherlands, PC World Benelux;* NEW ZEALAND'S *Computerworld New Zealand, Computerworld Norge, PC World Norge;* PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld, China Computerworld Monthly;* SAUDI ARABIA'S *Arabian Computer News;* SOUTH KOREA'S *Computerworld Korea, PC World Korea;* SPAIN'S *Computerworld, Computerworld Espana, Commodore World, PC World Espana, Comunicaciones World;* SWEDEN'S *Computer Sweden, MikroDatorn, Svenska PC World;* SWITZERLAND'S *Computerworld Schweiz;* UNITED KINGDOM'S *Computer News, ICL Today, Lotus, PC Business World;* UNITED STATES' *Amiga World, CD-ROM Review, CIO, Computer Currents, Computerworld, Digital News, Federal Computer Week, GO Micro, Focus Publications, InCider, infoWorld, Macintosh Today, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC Letter, PC World, Portable Computer Review, Publish!, PC Resource, Run;* VENEZUELA'S *Computerworld Venezuela;* WEST GERMANY'S *Computerwoche, Information Management, PC Welt, PCtechn, Run/Run Spezials.*

ADVERTISERS INDEX

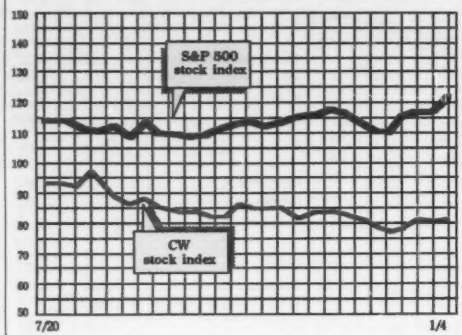
AI Corporation	62
AT&T	30,65
Banyan Systems	36
BASF Systems	24,87
Bull Peripherals	53
Cincom	21
Compaq	56-57
Computer Associates	3,28
Computer Assistance	45,47
Computerworld Circulation	81
Computerworld House	82
Duquesne Systems	88
Hewlett Packard	32-33
Hughes Aircraft Co.	12
Informix Software Inc	50
Innovation Data Processing	7
Interface Group	38
International Power Machine	40
Macro 4	10
Micom Systems Inc.	16-17
Micro Focus	29
Microsoft	26-27
NEC	64
Northern Telecom	48-49
Oracle Corporation	9,13
Pacific Data Products	20
Pilot Executive Software	66
Platinum Technology	23
Prime Computer	61
Radio Shack	42
Relational Technology Inc.	22
SAS Institute	54
Siemens	60
Software Engineering of America	11
Syllogy	25
Syncsort	5
Systems Industries	46
TBS Software Inc	59
3 Com Corporation	39,41
Unisys	58-59
Wang Labs	34-35
Winterhalter	37

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Look for These Upcoming Special Editorial Features in Computerworld

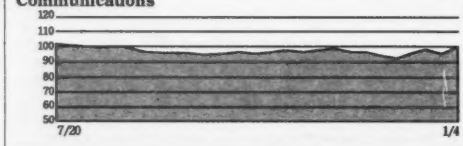
Issue Date	Executive Reports	Product Spotlights
Jan. 16		Corporate Electronic Publishing
Jan. 23	Restructuring MIS — The Data Center	
Jan. 30	Special Report: Communications Innovators	
Feb. 6		Micro-to-Host Links
Feb. 13	Special Feature: Recruitment	Performance Management Tools
Feb. 20	Strategic Planning	

STOCK TRADING INDEX

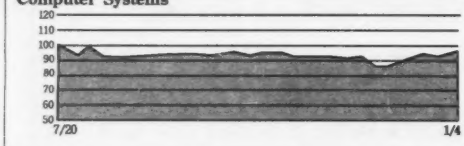


Indexes	Last Week	This Week
Communications	95.3	99.6
Computer Systems	93.2	96.4
Software & DP Services	102.8	106.4
Semiconductors	54.0	56.5
Peripherals & Subsystems	77.3	82.3
Leasing Companies	99.9	100.5
Composite Index	81.1	84.3
S&P 500 Index	116.2	117.9

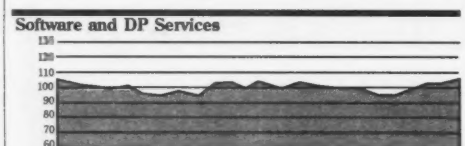
Communications



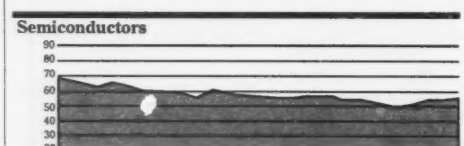
Computer Systems



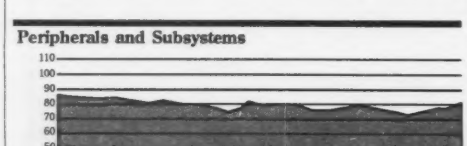
Software and DP Services



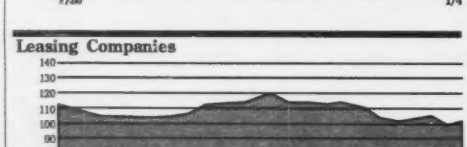
Semiconductors



Peripherals and Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JAN. 4, 1989

E X C H		52-WEEK RANGE (1)		CLOSE JAN. 4 1989	WEEK NET CHNGE	WEEK PCT CHNGE
		Communications and Network Services				
N	AMERICAN INFO TECHS CORP	98	82	95.125	-0.3	-0.3
Q	ANDREW CORP	20	13	19.5	-0.3	-1.3
Q	ARTEL COMM CORP	3	1	1.563	0.1	4.2
N	AT&T	30	24	28.75	-0.1	-0.4
Q	AVANT GARDE COMP INC	3	0	0.688	0.1	10.1
Q	AVANTEK INC	9	4	5.5	1.0	22.2
N	AYDIN CORP	17	12	15.5	0.6	4.2
N	BELL ATLANTIC CORP	75	62	70.375	-0.3	-0.4
N	BELLSOUTH CORP	44	36	39.375	-0.8	-1.9
Q	COMPRESSION LABS INC	5	3	3.625	0.1	3.6
Q	COMPUTER NETWORK TECH	2	1	1.376	0.2	14.4
Q	CONTEL CORP	41	29	40.125	-0.3	-0.6
Q	DATA SWITCH CORP	10	5	6	0.6	11.6
Q	DIGITAL COMM ASSOC	36	17	18.75	1.0	5.6
Q	DYNATECH CORP	24	17	18.75	1.4	7.9
Q	FIBRONICS INTERNATIONAL INC	5	2	4	0.1	3.2
Q	GANDALF TECHNOLOGIES	8	5	5.875	0.8	14.6
Q	GENERAL DATACOMM INDS	5	3	4.5	0.0	0.0
N	GTE CORP	46	34	44.125	0.9	2.0
Q	INFOTRON SYS CORP	14	6	10.625	0.4	3.7
N	ITT CORP	55	43	51.25	0.8	1.5
N	M A COM INC	11	8	8.875	0.5	6.0
Q	MCI COMMUNICATIONS CORP	25	10	23	-0.4	-1.6
Q	NETWORK EQUIPMENT TECH INC	23	14	17.75	1.8	10.9
Q	NETWORK SYS CORP	12	7	11	0.8	7.3
N	NORTHERN TELECOM LTD	20	16	16.375	0.0	0.0
Q	NOVELL INC	33	18	32	2.5	8.5
N	NYNEX CORP	71	61	65.75	-0.1	-0.2
N	PACIFIC TELESIS GROUP	33	25	30.75	0.3	0.8
N	PARADYNE CORP	10	4	10	0.0	0.0
A	PENRIL CO	5	3	4.375	0.3	6.1
N	PLESSEY LLC	41	25	41	1.8	4.5
N	SCIENTIFIC ATLANTA INC	16	10	12.875	0.1	1.0
N	SOUTHWESTERN BELL CORP	43	33	39.5	-0.9	-2.2
Q	3 COM CORP	25	16	24.5	3.9	18.8
N	U S WEST INC	60	49	57.625	0.1	0.2
		Computer Systems				
Q	ALLIANT COMPUTER SYS	9	3	4.125	-0.3	-5.7
Q	ALPHA MICROSYSTEMS	8	4	6.5	0.6	10.6
Q	ALTOS COMPUTER SYS	13	7	7.875	-0.3	-3.1
A	AMDAHL CORP	28	14	19.5	0.5	2.6
Q	APOLLO COMPUTER INC	17	7	8.875	0.3	2.9
Q	APPLE COMPUTER INC	48	36	42	1.8	4.3
N	BOLT BERANEK & NEWMAN	19	10	10.25	0.3	2.5
Q	BRITTON LEE INC	3	1	2.5	-0.1	-2.5
N	COMPAQ COMPUTER CORP	68	42	62.375	3.0	5.1
Q	COMPUTER AUTOMATION INC	14	3	6.125	0.4	6.5
A	COMPUTER CONSOLES INC	13	5	12.625	0.0	0.0
Q	CONCURRENT COMP CORP	7	4	4.5	0.1	2.9
N	CONTROL DATA CORP	31	16	20.625	0.4	1.9
Q	CONVEX COMPUTER CORP	11	6	10.25	0.0	0.0
N	CRAY RESH INC	89	53	61.5	2.5	4.2
Q	DAISY SYS CORP	12	6	6.875	0.1	1.9
N	DATA GEN CORP	28	17	19.125	1.3	7.0
N	DATAPOINT CORP	6	4	4.5	0.1	2.9
Q	DELL COMPUTER CORP	13	8	10.375	0.8	7.8
N	DIGITAL EQUIP CORP	145	86	100.25	3.:	3.2
N	FLOATING POINT SYS INC	5	2	3.625	0.8	31.8
N	HARRIS CORP	33	24	27.625	1.5	5.7
N	HEWLETT PACKARD CO	66	44	53.875	0.8	1.4
N	HONEYWELL INC	77	54	60.375	0.9	1.5
N	IBM	130	104	122.5	0.0	0.0
Q	INFORMATION INTL INC	16	10	14.75	0.4	2.6
Q	IPL SYS INC	5	1	4.75	0.0	0.0
N	MAI BASIC FOUR INC	21	8	8.5	0.4	-8.0
N	MATSUSHITA ELEC INDL LTD	230	169	205.625	0.6	0.3
Q	MEGADATA CORP	4	1	1.625	-0.1	-7.1
Q	MENTOR GRAPHICS CORP	37	19	30.75	3.4	12.3
N	NBI INC	7	2	2.5	0.3	11.1
N	NCR CORP	70	51	55.125	1.3	2.3
N	PRIME COMPUTER INC	19	12	18.375	1.0	5.8
Q	PYRAMID TECHNOLOGY	17	8	16.5	0.5	3.1
Q	SILICON GRAPHICS CORP	25	14	19.5	2.3	13.0
Q	STRATUS COMPUTER	32	20	28.25	1.3	4.8
Q	SUN MICROSYSTEM INC	20	13	17.25	0.8	4.5
Q	SYMBOLICS INC	2	1	1	0.1	6.6
Q	SEQUENT COMPUTER SYS INC	19	13	18.75	0.4	2.0
N	TANDEM COMPUTERS INC	30	12	17.5	1.4	8.5
N	TANDY CORP	49	32	40.875	0.0	0.0
N	ULTIMATE CORP	21	9	9.625	0.3	2.7
N	UNISYS CORP	39	25	29.125	1.3	4.5
A	WANG LABS INC	17	8	8.625	0.0	0.0
		Software & DP Services				
Q	ADVANCED COMP TECH	3	1	1.782	0.2	14.0
Q	AMERICAN MGMT SYS INC	19	12	17.375	2.1	13.9
Q	AMERICAN SOFTWARE INC	17	9	16.375	0.5	3.1
N	ANACOMP INC	12	6	7	-1.0	-12.5
Q	ANALYSTS INTL CORP	13	7	12.5	2.1	20.5
Q	ASHTON TATE	31	20	21.375	0.1	0.6
Q	ASK COMPUTER SYS INC	16	7	16.125	1.9	13.2
Q	AUTODESK INC	31	16	30.25	1.5	5.2
N	AUTO DATA PROCESSING	47	35	39.375	0.4	1.0
Q	BMC SOFTWARE INC	14	8	13.625	0.2	1.9
Q	BOOLE & BABBAGE INC	10	7	9.5	0.0	0.0
N	BUSINESSLAND INC	15	8	14.5	0.3	1.8
N	COMPUTER ASSOC INTL INC	33	24	33.375	1.9	6.0
Q	COMPUTER HORIZONS CORP	12	7	9.625	0.6	6.9
N	COMPUTER SCIENCES CORP	54	38	47.5	0.4	0.8
Q	CORPORATE SOFTWARE	15	8	10	0.0	0.0
N	COMPUTER TASK GROUP INC	17	10	13.5	0.0	0.0
Q	COGNOS INC	8	5	7.875	1.0	14.5
Q	COMSHARE INC	25	13	21	0.3	1.2
N	CULLINET SOFTWARE INC	9	4	6.75	0.1	1.9
Q	DUQUESNE SYS INC	23	16	22.5	2.0	9.8
N	GENERAL MTRS (CLS E)	45	34	44.5	0.0	0.0
Q	HOGAN SYS INC	6	3	4.625	0.0	0.0
Q	INFORMIX CORP	26	7	8.25	0.1	1.5
Q	INTELLICORP INC	4	2	3.25	0.0	0.0
Q	KEANE INC	16	7	14.25	0.8	5.6
N	LOTUS DEV CORP	34	15	19	0.9	4.8
Q	MANAGEMENT SCI AMER	14	6	8.375	0.5	6.3
Q	MICRO PRO INTL CORP	4	2	2.313	0.1	5.7
Q	MICROSOFT CORP	71	45	54.25	2.0	3.8
Q	MORINO ASSOCIATES INC	20	12	17.875	0.1	-0.7
Q	NATIONAL DATA CORP	32	19	24.75	1.0	4.2
Q	ON LINE SOFTWARE INTL INC	14	4	5.25	0.0	0.0
Q	ORACLE SYS CORP	22	11	20	1.5	8.1
N	PANSOPHIC SYS INC	19	12	14.125	1.0	7.6
Q	PHOENIX TECHNOLOGIES INC	18	12	15.5	0.8	5.1
Q	POLICY MGMT SYS CORP	26	19	23.75	-0.3	-1.0
Q	PROGRAMMING & SYS INC	18	8	17.25	0.6	3.8
Q	RABBIT SOFTWARE INC	3	2	3	0.1	4.3
Q	RELATIONAL TECHNOLOGY INC	21	12	15.5	0.4	2.5
Q	REYNOLDS & REYNOLDS CO	25	17	23.625	-0.9	-3.6
Q	SEI CORP	22	14	17.25	-0.3	-1.4
Q	SHARED MED SYS CORP	27	14	17.25	0.6	3.8
Q	SAGE SOFTWARE INC	8	5	7.75	-0.1	-1.6
Q	SOFTWARE PUBG CORP	27	8	18.75	-0.1	-0.7
A	STERLING SOFTWARE INC	9	5	5.75	0.3	4.5
Q	SUNGARD DATA SYS INC	20	14	16.5	1.3	8.2
Q	SYSTEMATICS INC	34	24	31.125	0.0	0.0
N	SYS. SOFT INC	27	12	26.75	0.0	0.0
Q	VM SOFTWARE INC	18	7	17.625	0.4	2.2
		Semiconductors				
N	ADV MICRO DEVICES INC	17	7	9	0.5	5.9
N	ANALOG DEVICES INC	16	10	12.75	0.8	6.3
Q	ANALOGIC CORP	9	6	8.75	0.3	2.9
Q	CHIPS & TECHNOLOGIES INC	21	11	14.125	0.4	2.7
Q	INTEL CORP	37	19	24.375	1.6	7.1
Q	LSI LOGIC CORP	14	7	10.875	0.3	2.4
Q	MICRON TECHNOLOGY INC	26	12	16.375	0.9	5.8
N	MOTOROLA INC	55	36	42.125	1.0	2.4
N	NATL SEMICONDUCTOR	15	8	10	0.5	5.3
N	TEXAS INSTRS INC	60	35	42	2.0	5.0
A	WESTERN DIGITAL CORP	18	11	15.125	0.5	3.4
		Peripherals				
Q	ALLOY COMP	5	2	2.75	0.0	0.0
N	AM INTL INC	6	3	5.125	0.3	5.1
Q	AST RESH INC	17	7	8.875	0.8	9.2
Q	AUTO TROL TECH CORP	6	3	5	0.0	0.0
Q	BANCTEC INC	12	6	10.625	0.5	4.9
Q	CIPHER DATA PRODS INC	10	6	9.625	0.3	2.7
A	COGNITRONICS CORP	4	2	2.375	0.1	5.6
Q	CONNOR PERIPHERALS	10	7	8.75	1.3	16.7
A	DATAPRODUCTS CORP	14	8	14.125	0.5	3.7
A	DATARAM CORP	9	6	7.375	0.0	0.0
N	EASTMAN KODAK CO	53	39	45.25	-0.5	-1.1
Q	E M C CORP MASS	19	4	5.375	0.6	13.2
Q	EMULEX CORP	11	5	11	0.4	3.5
Q	EVANS & SUTHERLAND	25	13	16.25	0.5	3.2
Q	ICOT CORP	5	2	2.5	0.0	0.0
Q	INTERLEAF INC	21	6	8.625	0.3	3.0
Q	IOMEGA CORP	5	2	3.75	0.1	3.4
Q	LEE DATA CORP	4	3	3	0.1	2.1
Q	MASSTOR SYS CORP	4	2	3.313	-0.1	-1.8
Q	MAXTOR CORP	16	6	9.75	1.5	18.2
Q	MICROPOLIS CORP	30	6	8.375	1.6	24.1
Q	MINISCRIBE CORP	14	6	8.5	0.9	11.5
N	MINNESOTA MNG & MFG CO	68	55	62.25	-0.4	-0.6
Q	PERSONAL COMPUTER PRODUCTS INC	7	5	4.875	0.2	4.0
Q	PRIAM CORP	3	1	1.313	0.2	16.7
Q	PRINTRONIX INC	11	7	8.625	0.5	6.2
N	QMS INC	14	6	8	0.9	12.3
Q	QUANTUM CORP	14	10	14	0.6	4.7
N	RECOGNITION EQUIP INC	12	6	11.875	0.0	0.0
N	REXON INC	9	4	7.25	0.8	11.5
Q	SEAGATE TECHNOLOGY	23	7	10.25	2.4	30.2
N	STORAGE TECH CORP	4	1	1.875	0.1	7.1
Q	TANDON CORP	3	1	1.125	0.1	5.8
A	TEC INC	6	2	2.875	-0.3	-8.0
N	TEKTRONIX INC	30	19	21.5	1.4	6.8
Q	TELEVIDEO SYS INC	2	0	0.438	0.1	16.8
N	XEROX CORP	63	50	58.25	-1.0	-1.7
		Leasing Companies				
Q	AMPLICON INC	19	9	18.25	1.3	7.4
N	CAPITAL ASSOCIATES INTERNATIONAL INC	7	4	8.375	0.5	8.5
N	COMDISCO INC	25	17	21.25	0.8	3.7
Q	CONTINENTAL INFO SYS	9	2	2	-0.3	-11.1
Q	LDI CORPORATION	14	10	12.75	0.3	2.0
Q	PHOENIX AMERN INC	4	3	3.188	-0.1	-1.9
Q	SELECTERM INC	6	3	4.875	0.1	2.6

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Smooth start

Good news prompts market patience toward job-cutters

Chalk it up to post-holiday mellowness: Good news moved tech stocks last week, while other news basically left them in place.

Digital Equipment Corp., on the eve of eagerly awaited workstation announcements, broke 100; DEC closed on Thursday at 100½, up 1¾ points from the week's starting price of 98⅜. Oracle Corp. announced yet another quarter of upward-spiraling sales and profits and saw its stock rise 1¼ points to 20¾. Apple Computer, Inc. picked up a technology research power base in Cambridge, Mass.; its stock picked up 2 points, closing on Thursday at 42¼.

On the other hand, in the wake of a reported net loss and diminished revenue for its second quarter, On-Line Software International, Inc. stock closed where it opened the week at 5. Continental Information Systems Corp. also held at 2⅛ after announcing a planned employee reduction that will bring the firm's recent job-cut total to 300. Wyse Technology announced a 15% work force reduction and closed at 6⅝, down ⅝ of a point. Alliant Computer Systems Corp. announced a work force reduction of almost 20% and closed at 4⅛, down ⅛ of a point.

NELL MARGOLIS

Bull

FROM PAGE 1

Bull with some "serious disjunctions" that will be beneficially eliminated, Bellomy added.

The employee cuts, Pampel said, in no way signify a change in Honeywell Bull strategy; rather, they are aimed at creating a company in condition to pursue strategies already in place.

Manufacturing and administration will take the hardest hits; "we're not touching sales," Pampel said. Details with regard to geographical impact will not be known until the company determines how many of the approximately 1,000 employees now eligible for early retirement will take advantage of what Pampel described as a "fairly generous early retirement plan."

"So much of where it hits will depend on the outcome of the early retirement plan," Pampel said. Whatever the outcome, though, Honeywell Bull will continue to vigorously pursue research and development activities at both of its current major R&D locations here and in Phoenix, Pampel said. Of the employees eligible for early retirement, approximately 650 are located in the Boston area; 250 now work at the Phoenix plant.

Charles P. White, program director of industry service at the Gartner Group, Inc. in Stamford, Conn., saw last week's action as "the precursor of a general [Honeywell Bull] reorganization that I've been expecting for some time."

White predicted that the company will further move to place its European operations under a single marketing group in preparation for the 1992 formalization of the European Economic Community trade alliance. Also, he said Bull might reduce headquarters staffing in pursuit of the distributed management, or decentralized decision making, that many market analysts regard as a hallmark of a survivor in the data processing arena.

The decisive tone and content of last week's announcement, Bellomy said, also signaled Pampel's recognition that Honeywell Bull has an image problem to overcome before it can become the computer market contender it wishes to be. "He's beginning to put his mark on the company," White said.

As predicted, Honeywell Bull announced earlier last week that French co-owner Groupe Bull had acquired 22.6% of the shares formerly owned by Minneapolis-based Honeywell, Inc., leaving Bull as majority owner with 65.1%, Honeywell with 19.2% and Japan's NEC with 15%. Pampel was emphatic in stating that the latter layoff announcement had "absolutely nothing to do with" the long-planned ownership shift. "As a matter of fact," he added, "Bull itself is going through some of the same kind of streamlining."

Alliant cuts one-fifth of jobs

BY NELL MARGOLIS
CW STAFF

LITTLETON, Mass. — Alliant Computer Systems Corp. stripped down for action in the increasingly competitive minisupercomputer market last week, paring the company of 75 employees — almost 20% of its work force.

Alliant said it expects the restructuring to decrease the company's annual costs by approximately $20 million. This, Alliant hopes, will thereby speed the company's return to the profitability that has eluded it for the past two quarters and is likely to prove missing when results are announced for the fourth quarter ended Dec. 31, according to President Ronald Gruner. It will also generate a "material" one-time fourth-quarter charge, Gruner said.

"The bare fact of the restructuring isn't likely to surprise many people. The magnitude of the write-off might," said Jeffry Canin, an analyst at Hambrecht & Quist, Inc.

While Alliant declined to quantify the impending write-off, Canin speculated that it could be in the $10 million to $15 million range.

Need to absorb

Canin called the move "more reactive than strategic" on Alliant's part. An early entry in the minisuper market, Alliant has been faced with the need during the past several months to absorb recently acquired subsidiary Raster Technologies, Inc. while battling a barrage of fierce competition, said Theresa Liu, an analyst at Montgomery Securities in San Francisco.

The purchase "expanded Alliant's product line but perhaps diffused its corporate focus," Liu noted.

Workstation announcements anticipated from Digital Equipment Corp. (see story page 1) are expected to further intensify the competitive pressure. Gruner, however, appeared sanguine with regard to the effect on Alliant of a DEC onslaught.

"Truly, the competition for us — implicit now, explicit in six months — is Digital," he said. "There's a fair amount of pent-up business out there, waiting to see what Digital brings out." When they see, Gruner said, "we think that a lot of them will decide on Alliant."

MAI hints at sweeter offer; Prime scorns it

BY NELL MARGOLIS
CW STAFF

TUSTIN, Calif. — MAI Basic Four, Inc. last week turned up the heat in its hostile bid for Prime Computer, Inc., indicating a willingness to sweeten its $20-per-share offer. Prime viewed the sugar as thinly coating an unpalatable proposition, and Prime users remained unruffled, even in the face of MAI's recent claim that more than 50% of Prime's shares have already been tendered.

In a letter addressed to Prime Chairman David Dunn and Chief Executive Officer Anthony Craig, MAI Chairman Bennett LeBow urged the cost savings of a negotiated transaction and suggested that MAI ownership might be inevitable.

Anything but, retorted Prime. In a letter to LeBow, Dunn called "absolutely untrue" MAI's contention that Prime's experience "must lead you to believe that there is no serious alternative bidder for Prime" and invited MAI to withdraw its bid.

Citing a litany of allegations of wrongdoing against LeBow and partner William Weksel, as well as major financier/co-bidder Drexel Burnham Lambert, Inc.'s recent agreement "to plead guilty to multiple felonies, several of which involved the fraudulent use of inside information," Dunn concluded that "we are skeptical that Drexel, Weksel and yourself would treat Prime and its stockholders any better than you have treated your customers and/or stockholders in previous situations."

Big eyes, big stomach

Early derided as all but incredible, the small California company's attempt to swallow up the far larger Massachusetts concern made a huge stride toward credibility with its year-end claim that holders of 24.2 million of Prime's shares have already accepted its offer.

Added to the 1.9 million Prime shares already controlled by MAI and Drexel, this gives the would-be acquisitor more than half of Prime's outstanding shares.

Nevertheless, last week's letter did not appear to be written from a position of strength, according to Stephen Dube, an analyst at Shearson Lehman Hutton, Inc.

The coy "offer to make an offer" nature of the correspondence, he said, cast doubt on MAI's confidence that it could amass the 85% of outstanding Prime stock mandated under applicable Delaware law to achieve a successful hostile acquisition.

In addition, Dube said, Prime's recent reorganization, consisting of a realignment and consolidation of business units as well as an approximately 10% work-force reduction, is expected to save the company approximately $50 million in 1989, making Prime worth more than it was when MAI priced its original bid.

Prime stock, which has been inching upward, closed Thursday at 18⅝.

"If Prime can get over $20 without opening their mouths, this offer could be moot," Dube noted.

Prime users do not appear greatly disturbed by MAI's actions.

"I can't say I'm excited about the prospect," said Jim Tunis, president of Lincoln National Information Service, Inc., a wholly owned subsidiary of Fort Wayne, Ind.-based Lincoln National Corp., which owns about 18 Prime systems.

Big enough?

"I was a little concerned when MAI first made its bid," said James Gaspers, MIS coordinator for the city of Scotts Bluff, Neb. "I still am. I'm not sure that a company the size of MAI can give us the level of support we're used to, and I'm not sure they'll have the wherewithal to keep the company alive."

Sharing the latter concern is Massachusetts Federal District Judge A. David Mazzone. Late last year, Mazzone enjoined MAI's tender offer pending further disclosure with regard to the deal's financial framework.

This decision was made particularly in light of Drexel Burnham's recent decision to plead guilty to six felony counts of mail, wire and securities fraud and a decision by the Delaware Chancery Court that upheld Prime's "poison-pill" provisions.

DCA chief steps down

ALPHARETTA, Ga. — Amid a spate of disappointing financial news, Digital Communications Associates, Inc. (DCA) announced last week that President and Chief Operating Officer James F. Ottinger resigned to pursue other business interests.

DCA Chairman Bertil D. Nordin will assume the duties of president until a successor is found. Nordin had previously served as president before promoting Ottinger to the post in 1987. Ottinger joined DCA in 1986 when his firm, Forte Communications, Inc., was acquired by DCA. Ottinger was not available for comment.

DCA also revealed that it will post a one-time charge of $12.6 million in connection with its December acquisition of Digital Transmission Systems, Inc. (DTS) — almost as much as the $12.8 million acquisition price.

The charge put DCA $4.2 million in the red for the second quarter ended Dec. 31. Without the charge, earnings would have been $8.3 million, or 57 cents per share, a 14% drop from year-earlier levels. Sales fell 5% to $52.2 million, placing DCA's six-month revenue slightly below fiscal 1988 levels.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, except: (6) issues in February, May, August and October, (5) issues in January, March, April, June, July, September and November and (4) issues in December with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970.
Reprints (minimum 100 copies) and permission to reprint may be purchased from Nancy M. Shannon, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

MPA ABC ABP BPA

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

TRENDS

'Service' redefined

Customers are redefining the term "service," and vendors have a tall order to fill. Four or five years ago, service referred almost exclusively to hardware maintenance. Now that hardware has become so reliable and service prices have dropped, users seek more than repairs.

Contributing to changes in customers' view of service is the shifting landscape of the user environment. Use of multivendor systems, networking and remote services is rising. Technical competence among users is growing.

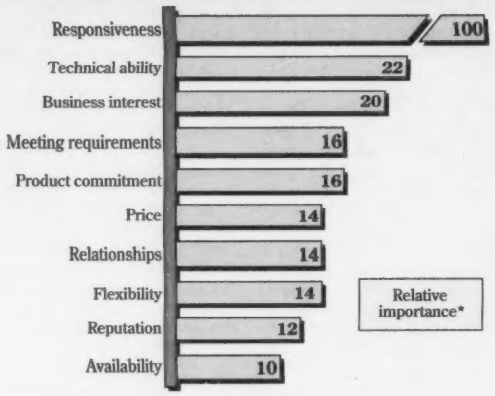
And MIS departments are taking on new roles: as contractors to develop and implement user applications; as vendors to provide installation, training and support; and as utility companies to offer telephone and transmission services.

The Ledgeway Group, Inc., a Lexington, Mass., market research firm specializing in the service industry, asked 45 MIS executives at Fortune 1,000 firms what they want from service providers. They found service is now a crucial factor in the product-buying decision. Quality of service and support lands in the top three factors influencing the executives' first-time and repeat purchases.

Customers also want vendors to understand them — not only their business practices but, more important, their technical environments. Vendors, they say, have proven uncooperative in multivendor settings.

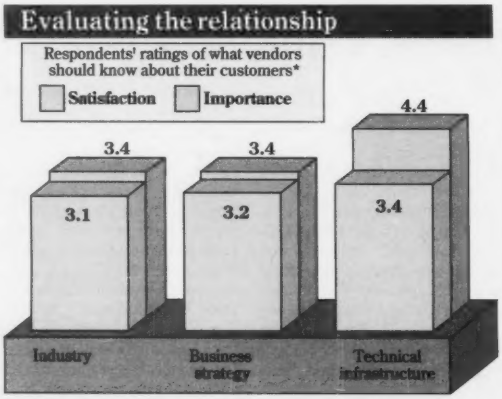
LAURA O'CONNELL

MIS' criteria for service vendors



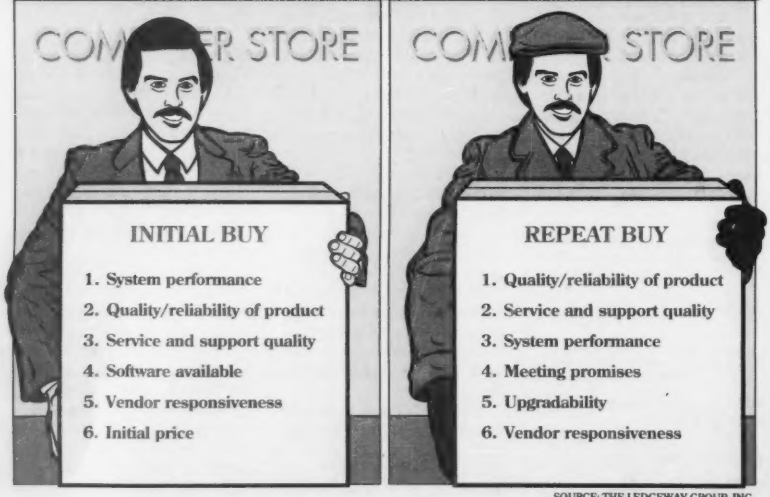
*Factor mentioned most was rated 100; other factors rated proportionally

Evaluating the relationship



*Based on a scale of 1 to 5; 1=low, 5=high

Shoppers' priorities shift between initial and repeat purchases



SOURCE: THE LEDGEWAY GROUP, INC.
CW CHARTS: FRANK C. O'CONNELL

INSIDE LINES

A Prime opportunity? Novell is expected sometime during the next four weeks to make a joint announcement with Prime, which is currently beset by a takeover campaign from MAI Basic Four. Sources close to both companies say to expect a Unix port of Netware. Last month, Novell cited Unix support as one of its goals for 1989, and beleaguered Prime is said to be looking for an entry into the PC LAN arena. Network consultant Frank Dzubeck suggests that Novell may wind up with a Unix port that is more specific to the Primos operating system rather than a generic product that will sing under many AT&T Unix System V-based operating systems.

Ask not for whom the Bell tolls. While DEC President Ken Olsen last fall was publicly denying published details behind the rumors of AT&T courting DEC as either a merger partner or takeover target in 1985, AT&T apparently came a-courting again, according to sources within DEC. With DEC's stock price wallowing in the $85- to $90-per-share range, AT&T saw DEC as an attractive target once again. Sources say DEC, on the very day of AT&T's approach, initiated a 10 million-share buyback of its own stock to bolster the price and fend off the suitor. Instead of responding to the published reports of the 1988 rumors, Olsen attacked, blasting *The Ultimate Entrepreneur*, a book by *Computerworld* editors Glenn Rifkin and George Harrar.

Don't look for DEC equipment with that speaker wire. Although Tandy has made the PCs that will debut at DEC's desktop announcement Tuesday, they will not be sold at the neighborhood Radio Shack. A Radio Shack spokeswoman said some subtleties exist that differentiate the DEC and Tandy machines. But for the most part, she said, the machines are "Digital's in name only."

Speaking of channels . . . Sales of the Tandy 5000, the company's Micro Channel Architecture-compatible PC, have exceeded expectations, said Ed Juge, director of marketing. Juge said that although Tandy is trying to keep up with back orders, sales are small in comparison with IBM PC AT-type system sales. But he noted that Tandy has "a hell of an advantage" over other clone vendors competing against IBM's locked-up distribution channels because the Tandy 5000 *can* be found at the neighborhood Radio Shack.

Buyouts and takeovers and all that jazz. Computer industry investment banking, mergers and acquisitions firm Broadview Associates' first contribution to the Bush administration would be considered a fairly big deal by most standards: Partner Edward I. Metz will ply his talents as a jazz pianist at the president's inaugural ball later this month.

$5 million and counting. This month, Microsoft will start spending money to promote its Excel spreadsheet for the PC, and it won't stop until it has blown $5 million. The effort is aimed at turning the heat up on Lotus, which has no graphical spreadsheet and — still — no 1-2-3 Release 3.0. Look for aggressive pricing, rebates, seminars and anything else that will help the product move out the door. Meanwhile, Microsoft plans to get a jump on the Presentation Manager market by shipping Excel/PM by the middle of the year. Look for a $50 upgrade charge.

Ringing into MAP. Expect to see AT&T become a Manufacturing Automation Protocol player in the near future. AT&T R&D subsidiary Bell Laboratories is reportedly working on an interface that will run MAP's Token-Bus protocol on top of fiber-optic cable, which now has no official place in MAP.

No spotlight-sharing this time. At DEC's lavish desktop rollout tomorrow, it will be K. O. solo. Recent DEC micro-related announcements have been held with Olsen introducing a micro partner CEO. Last year, it was Apple's John Sculley and Ashton-Tate's Ed Esber. Not this week; other CEOs will be as invisible as the fruits of the year-old Apple-DEC alliance. Anybody who has spotted a tangible DECapple product on a desk should phone it into the hot line (800-343-6474 or 508-879-0700) and get News Editor Pete Bartolik to roll out the news team.

Create a 3.5" Micro Diskette with unlimited protection against a hostile world.

You're covered. BASF molds the rigid plastic jacket of its 3.5" Micro Diskette to its own specifications, providing unsurpassed protection for the flexible disk within. Call 800-343-4600 for the name of your nearest supplier.

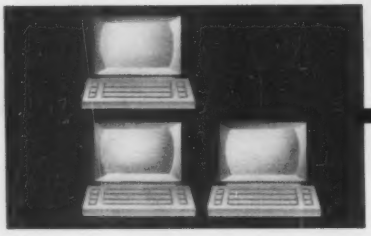
The Spirit of Innovation.

BASF

Discover Why Duquesne Systems Is the Choice of Over 4,000 MVS and VM Data Centers.

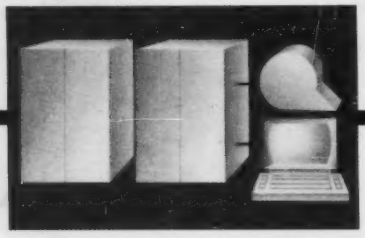
Enhancing Your Data Center Performance and Reducing Hardware Costs.

Network/Terminal Performance and Productivity



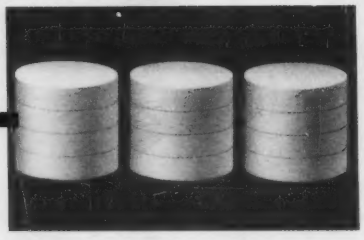
TPX–The leader in session management
STX–A link between SNA and non-SNA applications
NetSpy™–The VTAM network performance and response time monitor

Multi-CPU/Image Management and Integrity



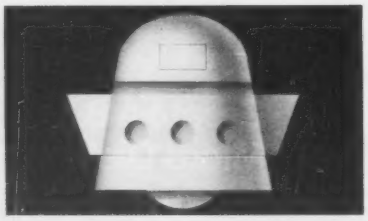
Multi-Image Manager–The only efficient way to simplify, protect and control sharing of DASD, tape drives and consoles in a multiple CPU or multiple image environment

DASD Performance and Optimization



DASDMON–Provides tuning solutions to improve DASD performance
PMO/Quick-Fetch–Helps increase throughput and improve response time by eliminating costly DASD/I/Os

Data Center Automation



AutoMate/MVS™–Automates and manages console operations and enhances system operations productivity
CheckOut/VM™–For total VM system component availability
SMR/JMR–For information management and retrieval

Billing/Chargeback

BDBF–The most comprehensive and flexible system for data center chargeback and job accounting, without the complexity of other products on the market

For more information about productivity enhancement system software products from Duquesne Systems, please call toll free, **800-323-2600**, or **412-323-2600** in Pennsylvania.

LEADING IN TECHNOLOGY AND SUPPORT

DUQUESNE SYSTEMS

Two Allegheny Center, Pittsburgh, PA 15212

United Kingdom (01) 686-0606 ■ France (01) 47.74.61.62 ■ Netherlands/Belgium (076) 22 93 44 ■ Germany (0211) 215 024
Switzerland (01) 461 21 11 ■ Italy-Milano (02) 9210.0527 Roma (06) 481.4143 ■ Australia 03-8941811

Represented in over 30 countries worldwide